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The Oil Man's Calendar

OCT. 12-14	American Society of Mechanical Engineers, Rochester, New York.
14-16	AIME, Petroleum Division, Los Angeles.
19	National Stripper Well Association, Wichita, Kansas.
19-21	Independent Petroleum Association, Wichita, Kansas.
27-29	National Safety Congress and Exposition, Chicago.
29-31	AIME Petroleum Division, Austin, Texas.
30-31	Illinois Mineral Industries Conference, Urbana.
NOV. 6	California Natural Gasoline Association, Los Angeles.
9-13	American Petroleum Institute, Palmer House, Chicago.
16-18	American Institute of Chemical Engineers, Netherlands Plaza Hotel, Cincinnati.
17-21	National Chemical Exposition, and Industrial Conference, American Chemical Society, Chicago.
19-20	American Association of Oilwell Drilling Contractors, Tulsa.
DEC. 2	New Mexico Oil and Gas Association, Artesia Hotel, Artesia.

Contents · October 12, 1942

Volume 107, Number 6

The Changing Panorama..... 7

Feature Section:

Washington Roundup..... 9
BY B. F. LINZ

War Empasizes Inferiority of Petroleum Substitutes....13
BY L. J. LOGAN

Metering of Oil-Well Production (Part I).....17
BY GEORGE L. PAULUS

Conservation of Gas in Louisiana.....28
BY H. W. BELL

Increased Rate of Completing Wells Recorded.....33

Practical Operating Hints for the Drilling Rig.....40

News Section and Index.....43

Looking Ahead with the Editor..... 2

Notes for the Equipment Buyer and User.....63

Squeaks from the Bull Wheel.....62

Index to Advertisers.....64

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SERVING THE OIL AND GAS INDUSTRIES

The Changing Panorama

Rationing and the Long Range View

PARADOXICALLY, nationwide gasoline rationing should increase the ultimate amount of motor fuel consumed, during the next two years, instead of curtailing the volume.

Under an automobile - conservation program, such as is about to be initiated through rationing of gasoline, the combined mileage traveled by all usable passenger vehicles during 1943 and 1944 probably will be twice that under unrestricted travel. This is due to the extended number of cars likely to remain on the road as a result of the conservation program on tire and mechanical life, which prolongment will more than offset the reduction in mileage. Since gasoline consumption depends mostly upon the total number of miles traveled, the volume of motor fuel consumed will be in proportion to the indicated extension of mileage.

In a study of the situation made last May, the Petroleum Industry War Council arrived at the conclusion that if we went merrily along and maintained normal speeds and average mileage of 9000 miles per car per year that tires would wear out so rapidly only 9 million cars would be in service at the end of 1943. It therefore follows that the end of that year would see these cars traveling at an annual rate of 81 billion miles (9 million cars x 9000 miles each), which would indicate an annual gasoline consumption rate of 5.4 billion gallons. The council study predicted that without conservation only 1.2 million cars would be in service the end of 1944. These cars would travel at an annual rate of but 10.8 billion miles, and therefore use only 720 million gallons of gasoline.

With conservation, the Council study estimated that due to reduced mileage and speeds 20.4 million cars would be in operation at the end of 1943. These cars would then be traveling at an annual rate of 102 billion miles (20.4 million cars x 5000 miles per car), and use 6.8 billion gallons of gasoline. Thus, a material gain as early as next year may result. A year later, the end of 1944, there would be 12.3 million cars in use, and thus the annual rate of travel would be 61.5 billion miles and gasoline consumption would be 4.1 billion gallons of gasoline.

Consequently, although an immediate reduction in gasoline sales can be expected when rationing is applied, the increased number of cars remaining in service will result in a greater overall volume. Gasoline consumption during 1943 and 1944 under rationing may total 10.9 billion gallons in contrast with only 6.1 billion gallons without any restrictions on driving—a gain of 4.8 billion gallons. Thereafter, of course, the difference becomes even greater.

Weather Is Unknown Fuel Rationing Factor

NOW more than ever before this country could use a sure-fire method of long-range weather forecasting, because that is about the biggest stumbling block there is in determining the amount of fuel oil that will be required for heating purposes this winter.

While there still remains many uncertainities in the actual amounts that limited transportation facilities will permit to be transported to the heavier consuming regions of the north and northeast sections of the country, most of the confusion that arises is due to the fact that no one knows how cold the winter is going to be. Fuel oil consumption varies almost exactly with the weather; if a winter is 10 percent warmer than usual, consumption is about 10 percent less. Last winter was mild through much of the United States. If this winter is even back to normal, a lot more fuel oil will be needed. If it is an exceptionally cold winter, demand will be way beyond last year. Present expectations are that emergency transportation methods will just be able to meet the limited essential requirements during the next seven months. But if the winter is unusually cold, even this curtailed goal may not be attainable.

Unfortunately, no one can predict the weather over long periods with accuracy. Neither can fuel oil be moved quickly enough in large volumes to supply requirements that would accompany a very cold spell. Likewise, if oil-burning heating plants are going to be converted to coal, they must be converted now and the coal ordered from the mines. If anyone knew with some certainty how cold the winter will be, consumers and industry could take steps to meet the situation. But without this information, home owners and the industry rightly are confused and live in fear of the coming winter.

Fuel Oil for Homes Completes a Cycle

IT WAS the coal shortage and coal strikes during and just after World War I that gave the first impetus to automatic oil heating. Prior to 1918 there was scarcely a domestic oil burner in the United States. In the two intervening decades the installation of oil burners in homes swelled so rapidly that the yearly increases in heating oil consumption far outran every other major petroleum product. Now the transportation shortages of World War II are forcing oil heating out, compelling consumers to revert to coal. Thus, peculiarly, oil heating has completed a full cycle of life between two wars. In the first it gained because of a shortage of a competitive fuel—coal, and now coal is displacing fuel oil because another war has disrupted petroleum's transportation system.

Gasoline Gives Cargo Planes Setback

PLANS for a large air cargo fleet is everywhere hedged in by war shortages. In addition to the shortage of raw materials, which already is slowing up plane production in some plants, there is a shortage of air crews, of landing fields and landing-field equipment in outlandish places, and most of all there is a scarcity of high-octane gasoline—practically all of which would have to be transported from the United States to various fueling spots scattered all over the globe.

The WPB Air Cargo Committee has developed some enlightening data, according to an article in *Fortune* Magazine, from which we quote:

"The average cargo airplane produces 11 ton-miles per gallon of gasoline. Stated in a different and slightly more accurate form, it requires approximately .55 pound per ton-mile of cargo capacity. An air fleet capable of winging 10 billion ton-miles per year would need one billion gallons annually—or a fifth of all the 100-octane gasoline estimated to be available by mid-1943. Yet there is not enough now for all the fighting, bombing, patrolling, and training that ought to be done. To be sure, the output is rising, but so is demand.

"Fuelwise, the air is a costly avenue

It yields only about one tenth the ton-miles per gallon of fuel that the sea returns. With present planes it takes about 35 tons of gasoline to get 5 tons of freight to Chungking, 14,000 miles away, and then get the plane back to the U. S. This is the extreme example, but serves to show one of the absurdities of the recent air-cargo excitement. Even on the run from Brazil to Cairo, with Caribbean fuel at one end, Middle East fuel at the other, approximately one ton of fuel must be transported by sea for intermediate bunkering for every ton of freight carried by air. An even more difficult situation prevails on the 15,000-mile round trip to Australia, with no indigenous fuel available beyond the starting point.

"Thus because of its need for vast quantities of gasoline, the air cargo, as it expands, creates it own considerable ancillary transport problem. Its efficiency varies in proportion to its ability to utilize local fuel.

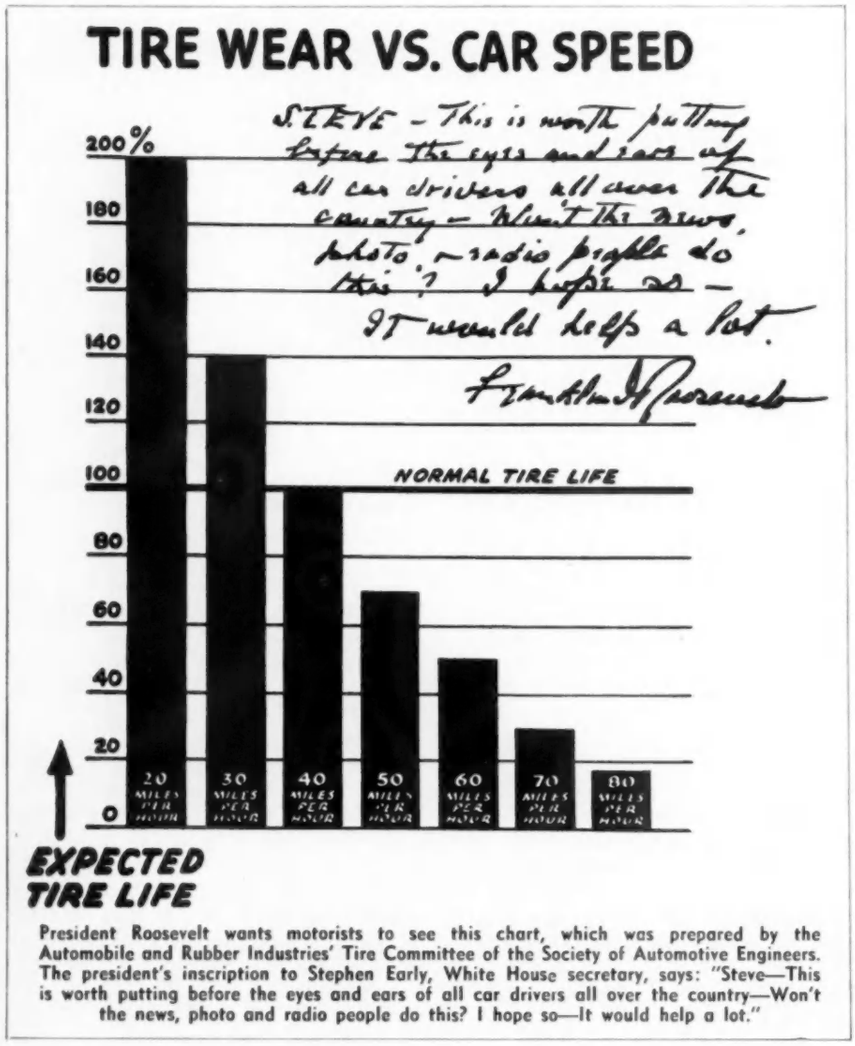
"For the quick delivery of a few tons of parts that will permit damaged bombers and tanks to return to action, and beyond the point where the plodding, vulnerable freighter ceases to pay off, or where railroads do not exist, the air freighter is a priceless tool for improvisation. Consequently, air cargo planes will assume an increasingly larger share of our shipping tonnage—but they are not likely to supplant sea ships."

START SAVING NOW

RUBBER Director William M. Jeffers has asked that all drivers observe the following suggestions for saving rubber during the time between now and when nationwide gasoline rationing is put into effect:

1. **Drive only when absolutely necessary.**
2. **Keep under 35 miles an hour.**
3. **Keep your tires properly inflated.**
4. **Have them inspected regularly.**
5. **Share your car with others.**

In submitting these suggestions, the Rubber Director says: "We must start saving rubber now. A voluntary campaign must be started to save precious rubber until the rationing program can be put into effect."


TIRE WEAR VS. CAR SPEED
STEVE - This is worth putting before the eyes and ears of all car drivers all over the country - Won't the News, photo - radio people do this? I hope so - It would help a lot.
Franklin D. Roosevelt
200%
180
160
140
120
100
80
60
40
20
0
NORMAL TIRE LIFE
20 MILES PER HOUR
30 MILES PER HOUR
40 MILES PER HOUR
50 MILES PER HOUR
60 MILES PER HOUR
70 MILES PER HOUR
80 MILES PER HOUR
EXPECTED TIRE LIFE

President Roosevelt wants motorists to see this chart, which was prepared by the Automobile and Rubber Industries' Tire Committee of the Society of Automotive Engineers. The president's inscription to Stephen Early, White House secretary, says: "Steve—This is worth putting before the eyes and ears of all car drivers all over the country—Won't the news, photo and radio people do this? I hope so—It would help a lot."

Do We Lack Gasoline, Or Men and Planes?

HOW much aviation gasoline would be needed for the much-talked of raids of 1000 planes a night against Germany? Nearly one-half of the United States daily production at the time that America entered the war, although only about 15 per cent of the United States production already projected at that time.

The difficulty may be less a matter of adequate fuel than one of sufficient men and planes, considering the usual 5-per cent loss of planes in action.

The 4-motored heavy bombers and 2-motored medium heavies of the British are said to require about 50 gallons of gasoline per engine per hour for a 5-hour trip over Germany. If a raiding force consisted of the two sizes in about equal proportions, the heavies would use within the night 500,000 gallons and the medium heavies 250,000, a total of 750,000 gallons, or 18,000 barrels. Within less than a week, a tanker load of aviation gasoline would be used up.

A bomber is manned by 6 or 7 men, including two pilots, navigator, wireless operator, 2 gunners, and flight engineer.

In a month there would be sacrificed, therefore, on a 5-percent-loss basis, not only 1500 planes but also 10,000 trained airmen, equivalent to Britain's whole first line strength when war began.

Use of Petroleum To Power Railroads

PETROLEUM fuels are providing an increasing share of the locomotive power required by the railroads to do the tremendous transportation job they have undertaken in 1942.

Quantities of fuel oil and diesel oil purchased by Class I railroads in the first six months of 1942 increased 28 percent and 61 percent, respectively, compared with the same period of last year, reports of the Interstate Commerce Commission disclose.

Use of fuel oil for locomotive power is confined almost exclusively to the railroads of the West, but the use of diesel oil, although it, too, is consumed mostly by western railroads, is spreading rapidly to other sections of the country.

Total consumption of diesel oil by United States railroads is still far below the consumption of coal and fuel oil, but it has been growing at a rapidly accelerating rate.

WASHINGTON ROUNDUP

By B. F. LINZ
Washington Correspondent

Senate Committee Told Crude-Price Increase Is Imperative

PIWC Monthly Session Gives Most Attention to Prices

WPB Relents to Permit California Increase Production

Final Unsuccessful Effort Made to Eliminate Depletion Allowance

Oil prices were a major subject of consideration in Washington during the week, as witness after witness told a Senate Public Lands Subcommittee that increased price was the only incentive which would spur wildcatters to increased prospecting activity and the Petroleum Industry War Council passed resolutions demanding quick upward revision of prices to protect the industry against possible disaster.

Several days of testimony before Senator O'Mahoney's group investigating means of increasing search and development brought out that the country already has been forced to work some fields in defiance of conservation precepts and that actual shortages of production may occur within 18 months in important areas.

There were indications, however, that even if sufficient incentive was given for an increase in exploration, the extent of the increase would be limited by the inability of the industry to get needed materials, while the immediate value of new oil discovered would be dependent to great extent upon the availability of transportation facilities.

At its monthly meeting, PIWC devoted itself largely to the question of price as involved in refinery and other changes required of the industry. Its committee on petroleum economics, expressing displeasure with the failure to attain required East Coast delivery levels, warned that further steps would have to be taken if even minimum winter needs were to be met.

Debate on the tax bill in the Senate brought a final but ineffectual effort to secure the elimination of the depletion allowance, ironically enough at the very hour when oil men were telling the O'Mahoney subcommittee that such action would be fatal to the industry. The move was made by Senator LaFollette, whose statements regarding the industry's need for and use of the allowance, echoing Treasury arguments, were diametrically opposed to the testimony given the subcommittee.

In a move to increase California production to avert a threatened shortage by 1944, WPB, at the recommendation of OPC, relaxed spacing requirements to permit the rehabilitation of hundreds of old wells in 84 fields throughout the state.

The immediate concern of rubber authorities is to make sure that present tires will last until new rubber becomes available, it was disclosed by Director William M. Jeffers, and intensive work to speed up the production program will not be undertaken until the new conservation plan is well under way.

☆

TAXES: Charging that the oil and mining industries were saving $124,000,000 a year in taxes as a specially privileged group, Senator Robert M. LaFollette of Wisconsin filed a separate report on the tax bill October 7 in which he urged its increase by $1,269,000,000 through elimination of percentage depletion, a requiring for the filing of joint tax returns, taxation of now exempt securities and increased corporation, income and estate taxes.

Citing the depletion rates granted oil and gas operators and metal-, sulphur- and coal-mine owners, LaFollette told the Senate that "experience has shown that these percentages far exceed the actual depletion of these various classes of properties.

"Most companies to which percentage depletion applies also compute their actual cost depletion for their own books and the information of their stockholders. Tax returns filed by 78 oil companies for the year 1941 show an aggregate of $30,600,000 deducted on the tax returns as percentage depletion while only $6,100,000 was deducted as depletion on their books in computing their income and surplus."

As copies of the Senator's report were made available, operators before the O'Mahoney subcommittee were testifying that elimination of the deduction would "paralyze" the industry and that, as a general rule, the money from the allowance was spent in prospecting and development operations.

"It is fair and proper that oil and mining companies be allowed the return of their capital free of tax and that is fully provided in the allowance for cost depletion granted by law," LaFollette argued. "However, percentage depletion goes far beyond the point where it can be so justified. Oil and mining companies are no more entitled to these extra concessions than any other business involving the investment of capital. It is a form of subsidy.

"As a subsidy it cannot be justified on the ground that it is necessary to increase our oil production, for with the rationing of civilian demand for petroleum products the national oil supply is far in excess of war needs."

Of the $124,000,000 which would be derived from elimination of the allowance, he said, $98,000,000 would come from oil and gas properties alone.

☆

OIL CZAR: Serious consideration is being given to the streamlining of the Administration's oil-control machinery and creation of a centralized agency to handle all phases of petroleum supply may be announced in the near future, it was indicated by President Roosevelt October 6.

The President's belief that a single agency might be more effective than the present split control was voiced in a letter to Senator Lodge of Massachusetts, who has pending a bill to establish a National Petroleum Agency.

"An intensive study has been under way for some time to determine the type of organization best suited to accomplish this objective and so designed

as to fit into the over-all pattern of organization of the war agencies," Mr. Roosevelt disclosed.

There is no need for legislative action to accomplish this, however, he said, since adequate power already has been granted to create such an agency.

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RUBBER: Believing that the most important immediate job is the safeguarding of existing supplies of rubber, the initial activities of Rubber Director William M. Jeffers are being devoted to the tire-gasoline conservation program and not until that is well launched will the expedition of the synthetic production program be undertaken.

Briefly stated, the new rubber administrator believes that it will be of little effect to get the production program speeded up if, before the rubber becomes available, the automotive transportation of the nation is forced to halt for lack of tires.

The three or four weeks spent now in putting into effect a program of rubber conservation, it is held, will result in keeping cars on the roads many months longer — the margin, possibly, between the availability of rubber when present tires are worn out and the disorganization of life and industry by the immobilization of passenger transportation.

The decision to attack the conservation problem first, however, was reached only after a full study of the whole situation which showed that the construction of new synthetic production facilities is progressing as programmed.

The necessary priority ratings, it was said, have already been given and provision has been made for assistance by the WPB in all cases where difficulty is encountered in securing materials for the new plants. The assignment of preference ratings has been speeded up by WPB as a result of the strictures in the Baruch report on the delays which have occurred in getting plants under way, but after the conservation program is well under way that situation is due for detailed study with a view to kicking it into high gear.

It is estimated that from two to four weeks will be required to get the conservation program well under way, but Jeffers is expected to be in the midst of his program to speed up production by the end of the month.

Already well under way is the plan to reduce speed limits to 35 miles an hour; the machinery for nation-wide gasoline rationing is being set up and details are being worked out for the periodic inspection of tires. By these and other means it is hoped to keep essential cars on the road throughout the period of stringency, right up to the time when the rubber industry is in a position to produce tires—of some sort or another—in large quantities.

In a nation-wide radio address October 6, Jeffers declared his intention of keeping automobiles, trucks, buses and farm equipment in service "until the day when we will have an adequate supply of rubber substitutes" and told the public that the only hope of doing so lies in the conservation program which he has outlined.

"I am no miracle man," he said. "This complex rubber problem has been churned and thrashed around here in Washington for a good many months. There have been divers plans. Obviously, they have not all been right. Perhaps the plan that I am adopting is not the one I might have selected a year ago, but it certainly is the fastest, most expedient and, I believe, the most workable plan that can be adopted as of this day and date.

"The Baruch report to our President is my textbook. That report had as a direction sign, that the road would be rough. It made specific recommendations for the production of synthetic rubber. It declared that it would be necessary to take its conclusions as of this day and 'bull them through.' I shall do just that.

"In progressing the recommendations of the Baruch report with reference to the production of synthetic rubber and related subjects, I am gathering about me the best technical talent in the nation, headed by Colonel Bradley Dewey of Cambridge, Massachusetts, a recognized expert, whom I have appointed as deputy rubber director."

The proposed ration program, Jeffers said, "is, to use a Western expression, admittedly rough justice, but it must be done."

Additional material made public by the Baruch committee October 7 as an "appendix" to its original report, disclosed that one fourth of all the butadiene to be produced under the administration's synthetic rubber program, will be derived from agricultural products.

Price and Supply Relationship Stressed by PIWC

PRICE and supply were outstanding subjects of discussion at the October meeting of the Petroleum Industry War Council October 6-7, with increasing emphasis upon the necessity for raising prices if the industry is to continue to meet demand through the war and into the peace to follow.

Running "day and date" with the O'Mahoney investigation of incentives to increased exploration, PIWC, in reports and resolutions, covered practically the same ground and came to identically the same conclusions regarding the necessity for quick amendment of the price structure.

A resolution demanding a substantial increase in prices of crude and products, provision of materials and supplies required to discover new reserves and adoption of a definite government policy recognizing currently changing conditions was adopted by the council, a copy being transmitted immediately to the O'Mahoney subcommittee.

Failure quickly to reverse the present trend of production in excess of discovery will definitely bring about a shortage, it was asserted in the resolution, which pointed out that little increase in output, without waste, can be obtained from present known reserves.

"Present crude-oil prices do not provide sufficient funds or the incentive for needed exploratory work," it was declared. "It is essential to the proper protection of our country that the necessary incentives be made available to stimulate increased exploratory effort. This requires the necessary materials and supplies and a compensatory price for crude oil."

Similar sentiments were voiced in a report of the committee on petroleum economics, in which it was disclosed that rationing and some further improvement of transportation will result in the industry being able to meet all estimated demand east of the Pacific Coast states for gasoline and other products, with the exception of kerosine and fuel oil for heating in the Middle West and East Coast areas, where supplies will run about 80 percent of requirements if the winter is normal and possibly 75 percent if it is severe.

The committee's estimates indicated

[*Continued on page 47*]

Senate "Round Table" Told Price Is Key to Adequate Supply

RAPIDLY increasing demands of the Army and Navy for oil products—the latter next year may be double present requirements — will bring the United States face to face with a definite shortage in 1944 or 1945 unless exploration and development are stepped up to several times their current pace, it was developed in the course of a "round-table" hearing before the O'Mahoney subcommittee of the Senate Public Lands Committee.

The sessions opened October 6 with a flat statement by Brigadier General Walter B. Pyron that while the War Department does not anticipate any difficulty in meeting its stepped-up 1943 requirements, demand will draw heavily on reserves and a possible shortage is seen on the West Coast if the war continues over a long period.

Pyron was supported by Captain A. F. Carter, U. S. N., who declared there is an "urgent need" for additional production and refinery capacity, "particularly in the West, where the relationship between actual available reserves and requirements is least favorable."

While neither officer could give definite figures of military demand, Pyron said 1943 Army requirements will "increase substantially," and Carter disclosed that Navy needs are "relatively high" at this time and may be doubled by the end of 1943.

"Whether or not the country is to face an oil shortage in the midst of a great crisis, as it has faced a shortage of steel and rubber, is still an unanswered question," Senator O'Mahoney said in opening the hearings.

"Not an Investigation"

"This is not an investigation, but simply an attempt to develop the facts so the Senate and the country may know what the problem is and what suggestions should be made to deal with it.

"It is generally understood production of oil has been falling off, although OPC has indicated great need for oil. I do not mean that there is less oil being produced, but that discoveries of new reserves are falling down.

"We can bring in new supplies either by encouraging wildcatting or by increasing production of known reserves, which may endanger the conservation policy or, third, we might find ways and means of developing the oil lands which are owned or controlled by oil companies but which are not listed among the know reserves."

Involved in the problem also, O'Mahoney pointed out, are the questions of steel and priorities and the relationship of price to production.

Around the committee table were Senators Hatch of New Mexico and Murdock of Utah and, at one time or another, Price Administrator Leon Henderson, Defense Transportation Director Joseph B. Eastman, Oil Coordinator Harold L. Ickes, Wayne Johnson of the War Production Board, W. B. Heroy, OPC director of petroleum reserves; D. R. Knowlton, OPC director of production, Assistant Deputy Coordinator Robert Allen, PIWC Chairman William Boyd, Russell B. Brown, general counsel of the Independent Petroleum Association, and other experts of the OPC, Geological Survey, Bureau of Mines and other agencies. Watson B. Snyder of the Department of Justice also attended the sessions.

Commenting on General Pyron's forecast of a possible shortage, Assistant Deputy Coordinator Allen told the conference that OPC is seriously concerned with the building up of a supply "not for 1943, but on into 1944 and later if the war demand continues that long and if our present increasing failure to find additional reserves continues."

Failing to Find Reserves

"This situation, in which we are steadily failing to find reserves at the rate at which we are using them, is one which to a geologist might indicate that his tools are getting dull; to a business man it might indicate that the law of diminishing returns is working against him, and to a statistical analyst it might actually mean that supplies are running out," Allen said. "Which interpretation is right none of us can say—I hope it is not the last."

Pyron explained that production to meet requirements on the West Coast is being carried on at such a rate as to endanger reserves. However, he added, the shortage is not expected to develop in 1943 because of accumulated stocks which will carry through the year.

"The prospect of shortage is not confined to the West Coast," Allen interjected. "There is a problem of shortage, due to transportation, on the East Coast. District 2, the Mid-Continent field, is not now able to produce oil to meet its own demand plus shipments to the East Coast, and in District 4, the Rocky Mountain States, there is no surplus of types of oil which are being used right now, although there is a good supply of heavy oil."

Discovery of new reserves remote from points of demand may raise transportation problems difficult of solution, it was pointed out by Fayette B. Dow, appearing as representative of ODT.

Possibilities that the time has come to give serious consideration to the production of oil from bituminous coals and shales of the Western States were suggested by Senator Murdock, and that phase of the situation was gone into exhaustively in later sessions.

"I don't want the enemy to get the idea that we are short of oil," Senator Hatch declared at this point, adding that "the industry will produce all the oil that is necessary" and will be given the assistance of the government, "even if it means an increase in price, and I believe Mr. Henderson will agree to that."

Behind on Wildcats

"From the very first day that I was given the assignment on price we recognized that production was paramount," Henderson responded.

To carry on exploration at the straight-line rate of 1937 to 1941 would call for the drilling of 3625 wildcat wells this year, but only 1500 were completed in the first six months of 1942, it was declared by F. H. Lahee, chief geologist of Sun Oil Company, Dallas, and vice-chairman of the American Petroleum Institute committee on reserves.

The API annual estimates, Lahee explained, are conservative, taking in only pools where some development has been undertaken and only to the extent believed justified by such operations, but for the areas covered are believed to be within five or ten percent of accuracy.

The figures show the declining production of new oil, he said, submitting figures by years which showed that new reserves dropped from 1,693,000 barrels

for each wildcat hole in 1937 to 621,000 barrels in 1941, in spite of the fact that each year the number of wells increased, running up from 2700 in 1937 to 3264 last year.

Lahee explained that the "most conspicuous" fields have been found, although big fields may yet be discovered, and exploration now is going on in areas from which smaller recoveries can be expected, and in areas where the risk of failure is greater and where drilling is undertaken on the basis of geophysical findings.

Agreeing that prospecting should be stepped up, Lahee told the conference that about one wildcat in six comes in, and that the chances of success are three times as good when drilling is done under geophysical findings than on older bases. A dry hole requires only about 14 tons of steel, he said, but about 78 tons is needed for a discovery well.

On the basis of past expansion of production, it will be necessary to find new reserves of 22,000,000,000 barrels or more by 1952, and by the end of another decade the cumulative figure from 1860 will be 90,000,000,000 barrels, of which 60 to 65 billion will have been produced and consumed and 25 to 30 billion should be in the underground reserve, it was declared by A. I. Levorsen, Tulsa geologist and operator, and chairman of the American Association of Petroleum Geologists research committee.

Need Reserves

"In other words, during the next 20 years, if we are to maintain the same rate of increase in supply and demand and the same ratio of reserve to annual consumption as has prevailed during the past 20 years, it will be necessary to add—by discovery or some now unknown method—oil on the order of 45 billion barrels," Levorsen said. "This is equal to the total amount found by all methods during the past 80 years."

There is a vast field still to be explored, he said, both within the areas of current development and production and on the partially explored fringes of those areas.

In the first, oil may be found in deeper producing formations, extensions to present fields and in the many favorable areas which come to light continually with the normal development of active provinces.

In the second, thick sediments as yet virtually unexplored are to be found in the trans-Mississippi Southeast—Florida, Georgia, Alabama and Mississippi; the trans-Pecos region of West Texas and New Mexico; the Anadarko basin of Western Oklahoma and adjacent parts of Texas, Colorado and Kansas; numerous basins up and down the entire length of the Rocky Mountains; the plains region of the Dakotas, Nebraska and parts of Montana and Wyoming, and the northern two thirds of the San Joaquin Valley in California.

"There is only one method of discovering oil and gas pools and that is by drilling wells," he reminded the conference.

"Even with a land as rich in oil prospects as ours, there is an urgent need for 'seed' money or there will be a short crop of oil a few years hence. In other words, something must be done to stimulate wildcat drilling. This can be done, in my opinion, by increasing the price of oil to such a point as to provide income from which exploration money can be obtained in a sufficient amount to double the wildcat drilling. And, if doubling the effort does not make the necessary discovery, then enough to treble it, because I feel we have every reason to believe that the oil is there to be discovered if we will but make the effort necessary to find it."

Prices Inadequate

Declaring that the government, having assumed control of prices, has the responsibility to see that prices are adequate, Charles F. Roeser, Fort Worth producer and former president of the Independent Petroleum Association, told the conference in a brief that an increase in the price of crude is the only way to eliminate the current serious threat to our oil economy.

In a detailed discussion of the possibilities of increasing production from present reserves, Roeser said this would not provide an adequate safeguard for the country's interests for a long war and it is "obvious that the rate of discoveries must be increased as soon as possible if the oil industry is not soon to be confronted with a real shortage of crude oil production."

The price of crude today is far below parity with prices of other basic commodities, he said, and an increase to act as an incentive to increased exploratory work, could not be considered inflationary.

"It cannot be proved exactly that the price of crude oil controls the amount of exploration for new crude oil reserves, but every available fact in the oil industry indicates that this is the case," he said. "It is quite clear that discoveries are dependent on the drilling of wildcat wells. It is equally clear from any examination of the figures on total wells drilled, compared with crude-oil prices, that every change in price of crude oil in the United States in all but 5 of the 25 years since 1917 has been accompanied by a change in the same direction in the total number of wells drilled. The oil industry knows that one sure way of getting the wildcatters into the field is to raise the price of oil to provide current funds and future incentive."

Taxes and Depletion

Other incentives to the search for oil, Roeser continued, are the present tax provisions for depletion and intangible drilling costs, but to insure the necessary volume of exploration effort, the industry's equipment must be protected, as must its labor supply.

Another incentive, he said, would be to place the exploration and development of government lands on the same basis as commercial leases, relaxing the numerous restrictions now imposed.

"Under a free economy, increased costs and the rapid depletion of our known reserves would today have provided a much higher price than that which we now have, without any inflationary influences," he declared. "It is impossible to state exactly how much the increase would be, but with available evidence of higher costs of labor and materials and the increasing difficulty of finding oil, it is the judgment of many observers in the industry that under former operating conditions the price of oil would now be at least 50 cents a barrel above present levels.

"At present selling prices for petroleum products, the oil industry is unquestionably giving its reserves away at prices that are much lower than the cost of replacement."

Roeser pointed out that a request for higher crude prices has been pending before OPA for more than 15 months, and declared that "someone in government must assume responsibility for early action, assuring a sound price basis for petroleum.

"The issue is too vital to the war effort for any halfway compromises," he concluded. "A shortsighted policy at this time might jeopardize the entire war effort through causing a shortage of production in the near future on account of inadequate reserves. No one should gamble with the winning of the war, regardless of the cost.

"In summary, the following points cannot be overemphasized:

"1. Because the United Nations are becoming increasingly dependent on the protected oil supply of the United States, the depletion of our reserves must be stopped and new discoveries increased to win the war and provide for a successful peace.

"2. Skilled labor in the oil industry must be protected.

[*Continued on page 34*]

For want of gasoline, this coal and coke burning producer-gas or gasogene installation replaces the tank of gasoline on an automobile in London, although such units are carried on trailers in many instances in oil-starved Europe. The garage attendant is letting off excess fumes from the unit. Compartment under license plate holds the coal and coke. Similar equipment is in use for burning wood, charcoal, or several other combustible solids.

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War Emphasizes Inferiority of Petroleum Substitutes

By L. J. LOGAN, Associate Editor

ALTHOUGH war has forced the development of some substitute materials that will permanently displace the originals, it has not brought forth any substitute fuels likely to take the place of petroleum products henceforth on an important scale.

On the contrary, the war has only emphasized the preeminence of petroleum as a convenient and efficient source of power for transportation by land, water, or air.

The oil-short Axis powers doubtless would eagerly trade all their equipment for making motor fuel from wood, charcoal, coal, and so forth for a few of the major oil fields and refineries that are held in large numbers by the United Nations.

Given enough supply of ordinary gasoline to replace the other fuels that are being resorted to in the absence of gasoline, the peoples of Nazi-dominated Europe and elsewhere would gladly junk the generally clumsy, inefficient installations that have been designed to provide motor transportation without use of petroleum-origin motor fuel.

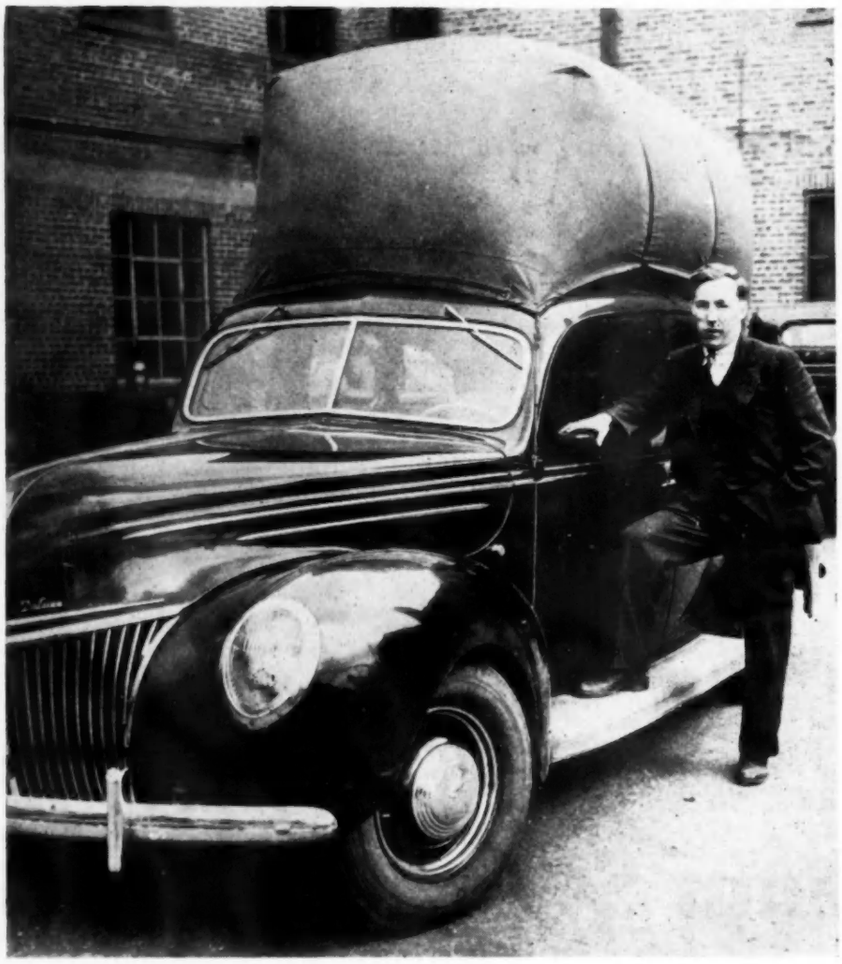
Axis military forces demand the bulk of the natural petroleum products available within the regions they occupy, and they use in substantial quantity only the better of the petroleum substitutes, namely benzol, derived from coal as a by-product of the coking plants; and the other synthetic oils, closely resembling petroleum, made from coal through the hydrogenation processes. Oils extracted from shale, similarly desirable substitutes for petroleum, likewise are belived to be going largely into military use.

These mentioned better-class substitutes apparently are the only ones that have any important possibilities as normal-time sources of transportation power.

All other forms of substitutes are produced in the Axis countries upon a scale only one fourth the equivalent of the production of benzol, oils from hydrogenation, and shale oils. And in view of the extreme dearth of motor fuels in Axis-land, with all possibilities of petroleum substitutes being desperately exhausted, this relative position of the miscellaneous "other" substitutes is significant. If it were practical to do so, the Nazis would be making and encouraging more important use of the secondary substitutes.

Likewise, the existing production of the better substitutes is comparatively small as viewed from the United States or other countries with adequate petroleum, even though German-dominated Europe apparently has about as much production from hydrogenation, benzol and shale oil as the output of natural petroleum, including Roumanian oil. For 1941, maximum estimates placed the European Axis powers' total available production of petroleum and substitutes at about 135,000,000 barrels, of which 53,000,000 barrels was petroleum, 49,000,000 from hydrogenation, 9,500,000 shale oils, 6,000,000 benzol, and about 16 000,000 from other sources, including 6,000,000 barrels alcohol, 8,000,000 wood and coal gas generators, and somewhat over 2,000,000 compressed gases. Incidentally, the 135,000,000-barrel total was estimated to be only about one half of the current consumption for all European military operations of the Axis.

While hydrogenation of coal is important to the extent of equaling Axis



Despite the balloon, this automobile travels only on land. The big bag of gas is a substitute for a tank of gasoline, as William Thornton of Edmonton, Alberta, Canada, uses natural gas to power his automobile; although a gadget enables him to switch from the gas to gasoline for fuel. While natural gas is here used, many similar installations, especially in Europe, employ manufactured or city gas, taken from the city mains at "filling stations." The balloon may not permit crossing some bridges or passing through tunnels, and snow on it in winter increases the pressure of gas to the engine, causing the motor to backfire. Also, it would be bad to run out of gas out on a highway.

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production of petroleum, it already has been developed approximately to the practical limits fixed by availability of coal, alloy steels, and labor, and no further substantial increase in output is indicated. Similar limits circumscribe shale oil production and even more definitely limited is output of the by-product benzol.

In reflection of the lesser desirability of the lower grade petroleum substitutes, they are used primarily for civilian purposes rather than in military operations.

Most important among them are ethyl and methyl (wood) alcohols. Ethyl alcohol is relatively high in heat content, a barrel of it affording about two thirds as much as a barrel of gasoline, while methyl alcohol's heat content is one half that of gasoline. Ethyl alcohol is made mainly from foodstuffs, such as sugar, beets, potatoes, and grains, and its importance as motor fuel is limited by the need of those source materials as food, particularly in war time, when foods are scarce. Methyl alcohol is obtained by distillation of wood or sulphite pulp from paper manufacture and by hydrogenation of carbon monoxide. Germany accounts for two thirds of all European use of alcohol for fuel, and France for one fourth, while Italy, Sweden, and Switzerland largely account for the rest. To a considerable extent, use of alcohol as fuel has reflected political pressure, having been advocated even in the United States, as a market outlet for farm products. It is obviously questionable in any case if foods should be so diverted from their most essential use, and even woods are put to apparently inferior use when made into power alcohol.

Employed in Europe to provide somewhat more aggregate petroleum substitute than alcohol are the various solids burned in gas-generating or "gasogene" equipment, for making motor fuel as used. Those units operate principally on coal, wood, or charcoal, although there have been experiments with other combustible solids as fuel, including straw briquettes. Any gasoline engine can be converted to run on producer gas or "gasogene," although at substantial cost, whereupon operation is similar to that when driven by gasoline. The producer gas or gasogene unit usually is mounted on a trailer behind the motor vehicle, although units have been built into the vehicle. The solid fuel is burned, and resultant producer gas or gasogene is cooled and scrubbed or cleaned of dust and ashes, after which it goes through a pipe to a modified carburetor and then into the engine. The gasogene unit is therefore a combination furnace and gas trapping device, and it adds substantially to the weight of the transporting vehicle, besides requiring attention in filling up with fuel and in cleaning out.

Aside from the inconvenience and installation cost involved in use of producer gas equipment, an important disadvantage commonly encountered in Europe is the scarcity of the combustible solids which are intended to alleviate the shortage of gasoline. Wide scale resort to the gasogene units in various countries has given rise to the threat of shortage of wood, as in Denmark, Italy and France, where timber supplies are limited. Similarly, coal cannot well be spared from established essential uses, even in Germany. Hauling of the solids to "filling stations" also puts additional strain on already overburdened European railway transportation. There has been a remarkable growth of the use of producer gas equipment in Europe during the war, as a matter of virtual necessity, nearly 500,000 vehicles with such equipment having been in use in 1941, of which about one half were in Germany, while most other European countries used them in smaller numbers. There is much room for refinement of the gasogene equipment, and it doubtless will be further developed during the war. But gasogene vehicles offer no serious threat of permanently displacing gasoline driven vehicles.

Furnishing about one fourth as much gasoline equivalent as the gasogene units are the installations employing compressed fuel gases as motor fuel. They fall into two general classes, those of low pressure and those in which the gas is compressed at 75 to 5000 pounds pressure. Low-pressure units, introduced during the first World War, embody large fabric bags or balloons, into which are filled gas from city mains or other sources. However, the balloons are about as large as the vehicles on which they are placed, and they cause serious wind resistance and make passage over

More compact and efficient than fabric bags for carrying gas at low pressure are steel cylinders of high pressure gas, or "bottled" gas, stored in the luggage compartment of the automobile or inconspicuously on a truck or bus; although the heavy cylinders are a substantial extra burden for the vehicle. Various forms of gas are compressed in the cylinders, to furnish fuel that substitutes for gasoline, as many countries suffer petroleum shortage. In this automobile in France, the tanks store ethane and ammonia, which are combined in a special carburetor. Frequently used in the "bottled" gas units are manufactured or city gas and methane, which is widely available, coming from natural gas fields, sewage disposal plants, oil refineries, coal carbonization, coal hydrogenation, and other sources.

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many bridges or through tunnels impossible. Nevertheless, these installations are in considerable use in Great Britain as well as on the continent of Europe.

High pressure gas installations represent an adaptation of "bottled gas" to trucks, busses, and automobiles, and naturally are more practical than the clumsy low pressure automotive equipment. Germany leads in use of the high pressure compressed gases, having about 75,000 vehicles so equipped, and making use of most of the gases suitable for the purpose. Those bottled gases include propane and butane obtained in hydrogenation plants, manufactured or city gas, methane, and coke oven gas. City gas and methane, available in relatively large volume, are especially important among these gases. Methane is obtained from natural gas fields, sewage disposal plants, coal hydrogenation, coal carbonization, and oil refineries. (Sewage gas as it comes from the disposal plant is 64 percent methane and 35 percent carbon dioxide and is richer in caloric content than city gas.) These gases are compressed in steel cylinders of about 1.4 cubic foot capacity, 212 cubic feet of gas being compressed to about 2000 pounds pressure per square inch, and two to four of the cylinders being necessary for each vehicle. Time for filling the cylinders is about the same as for filling a gasoline tank. Conversion of the vehicle to the equipment requires advance of the spark, change in the carburetor, and installation of valves for stepping down the gas pressure before entering the carburetor, at cost of $150 to $175, in addition to which the expense includes about $20 for each gas-containing cylinder used. An important disadvantage is created by the weight of the steel cylinders. Another is the relatively low heat content of the gas as compared with that of gasoline, although it is much higher than that of the above discussed producer gas made from wood or coal as the vehicle travels along.

The war has brought scarcity of motor fuel not only in Europe but also in many other parts of the world, with resultant efforts to alleviate transportation difficulties by using gasoline substitutes. Some of the South American countries, for example, have experienced serious fuel shortages, and have had to use substitutes, including corn, wood, cottonseed cake, and maize. Brazil has no petroleum production of consequence, and is severely handicapped by war-caused shortage. In the state of Para, no gasoline is sold for operation of private motor vehicles. The only cars in operation are ambulances, official cars of the governor and chief of police, and busses and other public carriers. Not even physicians are using automobiles. Producer gas units are being made and operators of trucks and busses are required to equip a tenth of their vehicles with such units.

Argentina's Y. P. F., governmental oil company, is manufacturing corn briquettes for domestic and industrial fuel use. At the middle of September, plans were being formulated for rationing of petroleum, under which the objective was a 30 percent reduction in consumption. That country produces about two thirds of its normal petroleum requirements, and apparently must now virtually do without imports. Canada is beginning to use producer gas equipment utilizing Douglas fir charcoal.

In the United States, shortages of petroleum have been actually shortages of transportation, and there is only remote possibility that gasoline substitutes may have to be employed, while lack of materials for equipment to make the substitutes would discourage their development. In Australia and other countries that formerly depended on Far Eastern fields for petroleum, serious scarcity of petroleum naturally exists now, and use of gasogene and other substitutes is encouraged. Charcoal burning equipment is in wide use.

It is in Europe, however, that the need for gasoline substitutes is most urgent, with the war in progress, that continent having been extensively mechanized, while that portion of it excluding Russia produces only a small fraction of its requirements of petroleum and merely three percent of the world output. Reports from Europe indicate that lack of fuel has immobilized virtually all motor vehicles there except the relatively few that are considered strictly essential. Before the war, Europe

had about 4,300,000 private cars and 1,400,000 commercial motor vehicles. Of those vehicles, it has been estimated recently that only about 1,000,000 now remain in operation. The others are laid up by the gasoline shortage, if they have not been destroyed or commandeered by German military authorities.

Within Germany, all kinds of substitutes for petroleum are being employed, as above indicated, and having been unceasingly war-minded, that country has been foremost in development of petroleum substitutes.

However, all Europe now is forced to take active interest in petroleum substitutes. The several neutral countries as well as the Nazi-dominated countries must use the substitutes, as must the United Kingdom to some extent.

Italy is short of wood and coal as well as gasoline, and cannot extensively use producer gas. The Italians plan to build a large synthetic oil plant in the province of Toscana, according to recent report, to operate on lignite, although inability to obtain machinery from German manufacturers heretofore has prevented effective offsetting of lack of oil imports by synthetic production. Italy had in operation in 1941 about 5000 busses and trucks that used producer gas, and an airplane successfully tried out gasogene equipment burning charcoal.

Spain has in operation its first shale oil distillation plant, located at Puertollano. A considerable part of the country's motor fuel lately has consisted of alcohol made from grapes, of which there was a surplus. There has been only limited use of gasogene equipment.

In Portugal, private motoring has ceased, and essential motor vehicles are being converted to producer gas use.

In Switzerland, about 2000 motor vehicles are operating on producer gas made from wood. But wood, charcoal, and other solid fuels are not available in quantities adequate to replace gasoline, while it is impossible also to supply the gasogene equipment in required quantities because of the shortage of materials. Methane gas is being reclaimed from sewers in Zurich, for operating trucks. An acetylene producer, using calcium carbide and water to produce acetylene gas, has been tried out on a limited scale, and is tentatively reported generally more satisfactory and efficient than gasogene equipment.

Sweden has shale oil plants in operation on its important shale deposits, and production is expected to be about 200,000 barrels of oil a year, including about 85 percent fuel oil and the rest largely gasoline, including a little aviation grade. Sweden's forests make producer gas installations practicable under war conditions, and the country is a leader in development of such equipment. Three out of every five motor vehicles there now are propelled by producer gas. A recent report indicated that over 70,000 trucks, busses, and passenger cars burning producer gas were in service on Swedish roads, while several thousands of tractors consuming such fuel were employed in agriculture. In addition, gasogene equipment with in use for rail busses, stationary motors, and small vessels. Two fifths of the generators in use employ wood, and the rest largely charcoal. Also in some use in Sweden are electrically driven vehicles and cars propelled by acetylene gas, illuminating gas, and methane gas.

Norway is estimated to have around 3500 gas generators in use, mostly on trucks transporting wood, lumber, food, and other products.

Finland had 8500 motor vehicles equipped with producer gas units, using wood and charcoal, more than a year ago, gasoline supplies having been cut off from private motorists early in the war.

Motorists in Denmark are forced to utilize wood in producer gas units in order to continue use of their vehicles, but depletion of limited forests is threatened, and use of peat instead has been called for by the government. Of 33,000 busses in operation, over a third are driven on producer gas made from wood, charcoal, or peat. Any further increase of the use of wood would require importation of that fuel from Sweden and Finland.

Before the war, France was the most highly motorized country of the continent, with a car for every 17 people. But out of 2,300,000 pre-war motor vehicles, over half are said to have been destroyed in 1940. Producer gas equipment has been put to use, but such use has aggravated the shortage of wood, while attempted synthetic production of gasoline from wood also is lacking in promise because of depending on a scarce material. Private cars using gasoline are not allowed on French roads, and official cars are restricted severely. Producer gas cars are allowed only for doctors and for essential business use. The Vichy government is reported to be arranging with French Morocco and Algeria for delivery of 1,000,000 tons of charcoal annually for use in producer gas units.

At the beginning of this year, over 6000 out of a total of 45,000 motor vehicles in operation in Belgium were equipped with producer gas units.

Rigid restrictions are applied on use of motor vehicles in German-occupied Netherlands, only the most essential travel being permitted.

Estonia has been stripped of its shale oil production by the Nazis, who control the country, and increased production of peat in compensation is being attempted.

Slovakia has imported from Switzerland some wood gas generators for converting trucks to charcoal operation.

Producer gas has been developed extensively in Russia, especially for trucks and tractors, to take advantage of that large country's coal, forests, and peat in areas where petroleum is not readily available.

Private motoring has been eliminated in England, and use of motor fuel by trucks and busses has been increasingly curtailed, while efforts are being made to effect a 10 percent reduction in the industrial use of lubricating oil, and refineries have been built to reclaim lubes. Producer gas equipment burning coal and coke is in considerable use on motor vehicles, and there is some use also of low pressure and high pressure gases, carried on vehicles in "balloons" or "bottles."

Ireland obtained in 1941 only about 40 percent of normal supply of gasoline and is expected to import in 1942 only 20 percent. Use of motor vehicles was prohibited May 1, 1942, and only 10 percent of the vehicles were exempted from the restrictions, mostly owned by physicians, nurses, and clergymen. Even commercial trucks in essential service are allowed only curtailed supplies of fuel. Lubricating oil consumption has been cut to a third of normal, and reclaiming is practiced. Horse-drawn stage coaches and mail delivery vehicles are being revived.

Producer gas or gasogene equipment was described in detail in an article in the July 18, 1942, issue of *Foreign Commerce Weekly*, United States Department of Commerce publication, and information was embodied on the use of such installations throughout the world.

Comprehensive data on gasoline substitutes as well as numerous references on the subject were embodied in the paper, "Substitute Fuels as a War Economy," by Gustav Egloff and P. M. Van Arsdell, presented to the Division of Petroleum Chemistry, American Chemical Society, at Memphis, April, 1942, and published in the July, 1942, issue of the Journal of the Institute of Petroleum, London.

In that paper, the authors pointed out that many types of motor fuels and substitutes are being used by the Axis powers, and stated that "the relatively poor quality of the Axis fuels has curtailed the maneuverability of their automotive transportation, including airplanes." They further made the significant assertion that: "The successful conclusion of this war will be based largely on the superior quality and quantity of the motor fuels available to the United Nations in unlimited volume."

Metering of Oil-Well Production

PART 1

By GEORGE L. PAULUS, Meter Engineer
Union Oil Company of California

IN THE present emergency much emphasis is being placed on conservation of certain materials which are in demand for war use. Steel is one of the materials whose use in other than war industries should be limited as much as possible. In the production departments of oil companies, one way of reducing the use of steel is to install meters instead of tanks for gauging. When present tanks need extensive repairs they can be replaced with meters. The old tanks thus are made available as scrap for steel production. With steel tanks hard to procure, meters are a solution to lease-gauge problems.

To illustrate the saving in steel when oil meters are used, the tank-gauging method usually requires two tanks and a pump with a prime mover. If two 250-barrel tanks are used, about four tons of steel are used in their fabrication. In the case of the oil meter, the materials used in the oil meter and air eliminator combined would probably be little more than that used in the pump and prime mover. Therefore a saving of material is realized equal to the weight of the tanks. Where larger gauge tanks are involved the saving would be much greater.

Another more important reason for considering gauging by meters is elimination of hazard due to the storage of oil when gauge tanks are used. With the present threat of sabotage and the possibility of an attack by enemies, everything possible should be done to minimize the danger to oil properties. The fire hazard due to the presence of gauge tanks in peacetime is serious; with the added possible hazard of sabotage, bombing and gun fire, more emphasis than ever should be placed on elimination of all the lease storage possible.

To get a better picture of the possibility of eliminating storage on a production property, it might be well to briefly describe two imaginary properties. Assume that each of the two leases have 50 producing oil wells. Take first the lease where tanks are used for gauging well production. If two 250-barrel gauge tanks per well and three 2,000-barrel tanks are allowed at the central setting, it can be assumed that at any time of any day the minimum amount of oil present in tankage on this lease would be in the neighborhood of 7,000 barrels. To compare this with the lease where oil meters are used; there would be an oil meter and air eliminator at each well and perhaps two meters working on the oil being shipped from the lease. Since the air eliminators seldom have a capacity of over 1 barrel there would be a maximum of about 100 barrels in eliminators and meters on the lease at any one time.

In addition to eliminating storage, the property with meters is more desirable for other reasons. In an emergency, oil meters are much smaller than tanks and thus offer a smaller target as well as making the lease as a whole less conspicuous. With the present practice of using portable derricks for well cleaning or repairing, a lease without derricks and without tanks would not be easily detected from the air. If shells or bombs scored a hit on a producing property where meters were used, the damage from the resulting fire would be less because of the absence of large batches of oil to spread the fire rapidly. With meters in service the localizing and control of the fire would be more easily accomplished.

A well meter will not give the individual well's daily rate of production with the certainty of the gauge tank. In most cases, however, with the proper use of oil meters, this daily rate can be determined accurately enough for all practical purposes. A number of production problems also arise, so there are certain advantages and disadvantages in both tank- and meter-gauging methods.

With metering of production not a universal practice, it is natural to ask, what meters are available, how efficiently do they do their work, and what are their operating and installation problems and practices?

First consider a little of the history of metering oil wells on the Pacific Coast. To the best of the writer's knowledge, the first attempt to meter the production from an oil well in California was made about 1924. The meter used was a displacement type piston meter and this particular make had been in use before this time for measuring oil, water and other homogeneous liquids. This first oil-field metering was done in the Los Angeles basin on pumping wells. The gravity of the oil was 32° API and the cut of water was average. The meters gave considerable trouble and in 1929 they were taken out of service.

Meanwhile another try was made in the Los Angeles basin with a positive-displacement-type meter. The meter was tried on a flowing well making about 31° API oil, cutting very little water. The test was so satisfactory that instead of providing gauge tanks for the new wells on the lease where the trial was made, meters were provided for the gauging of the production.

The piston-type displacement meters continued to be installed during the next few years, especially on flowing wells. Then about 1930 the weight-type meter made its appearance and was installed to measure well production. Oil companies on the Pacific Coast made production-meter installations during this period more or less on a trial basis. They realized that the oil meter had many advantages and were interested in finding whether or not they would perform to their satisfaction as gauging equipment. Needless to say many difficulties were encountered and some disillusioning experiences were had.

However, the advantage of meters was apparent and recently more and more of them are being used on new installations and as replacements for gauge tanks. New meters have made their appearance and although the perfect oil-well meter has not yet arrived, the increased interest is bound to help in the development of more satisfactory meters.

In the last two years many more oil

companies have made production-meter installations. Different companies have installed various types of meters. The use of meters on the Coast recently has increased rapidly until several thousand are in use for gauging well production.

Numerous Problems

Numerous problems confront the meter engineer when he starts to work on the problem of metering well production. An oil well, unfortunately, does not produce an abrasive-free homogeneous liquid. At all stages in the life of the well, the production consists of a mixture. This mixture includes gaseous, liquid, semi-solid and solid matter. Then to complicate the problem, each of the physical states is a mixture in its own right. It is possible then, for the meter to receive into its measuring chamber a mixture composed of the following: (1) mixture of hydrocarbons which are in the gaseous state at the temperature and pressure of metering, (2) mixture of hydrocarbons which are liquid at the temperature and pressure of metering, (3) salt water and its accompanying water vapor, (4) hydrocarbon "wax" which has a consistency of cup grease at metering temperatures and pressures, (5) formation sand, (6) precipitated salt scale, (7) foreign solid materials such as stuffing box rubber-packer rubber and canvas, waste and rags, the last of these two being introduced by careless workmen, (8) chemicals which are corrosive, such as sulphur compounds, and (9) chemicals for dehydration purposes which are often introduced upstream of the meter.

The production from an oil well may consist of as few as two of the above materials but it is not uncommon to find all present. Unfortunately, most of the meters available for production measurement have been designed to handle relatively clean liquids and in most cases the meter which has been designed for clean liquids is tried on oil well production without any changes, with the hope that it will happen to have been designed in such a manner as to do the job satisfactorily.

Keeping in mind what the meter is required to measure, the operator can consider the meters available for the job. The meters in use for measuring well production in California may be divided into three general types: (1) positive displacement, (2) current, (3) weigh. Each of these types will be discussed along with the operating problems that usually are encountered.

Positive-Displacement Type

The positive-displacement meter in general consists of a piston or its equivalent which moves through a definite cycle in a cylinder or chamber. By its motion, material which has entered the meter from the upstream side is "pushed" by the piston into the line downstream of the meter. Each cycle of the piston thus displaces a definite volumn of material and the number of cycles is recorded by a register which, by means of gearing, is calibrated to read directly in the desired unit of volume, such as barrels. The volume per cycle is controlled by the piston covering and uncovering ports in the cylinder at a definite point in the cycle, or the piston imparts motion to a valve or valves which cover and uncover ports at a definite point in the cycle. Several such pistons and chambers can be, and are, linked together to give multi-cylinder meters.

Positive-displacement meters are often compared, for the purpose of explaining their operation, with positive-displacement pumps. In the case of the pump, energy is added to the liquid being handled whereas the oil meter consumes some of the liquid's energy in its operation. The amount of this energy consumed usually is measured in terms of pressure drop across the meter. This pressure drop generally is used as one of the coordinates when plotting performance curves for meters. The meter manufacturer strives to obtain the greatest possible delivery through his meter in gallons per minute for a given pressure drop. When measuring the production from oil wells a small pressure drop is not nearly as important as it would be in some other installations, such as a tank-truck installation. On flowing wells, the operator usually has the problem of dissipating energy, and on pumping wells a pound more or less of pressure drop across an oil meter fades into insignificance when one considers the energy required for lifting the liquid to the surface. In some cases two or three pounds pressure drop across a meter is an advantage, as will be seen later.

Meters of this type have certain limitations when the operator recognizes the problem in the variety of materials that may be included in the fluid delivered to the meter. Since the duplication of volume per cycle is what determines the accuracy of a meter, the seal between the cylinder and the pistons and valves must be as positive as practical. When this seal is sufficiently perfect to stop liquid by-pass, it is also good enough to stop the by-pass of a large percentage of gas. Therefore, if gas is introduced into this type of meter, the registration which should account for liquid only, will be greatly in error. It becomes essential then, when using these meters, that all free gas present in the well's production at the temperature and pressure of metering be removed in order to obtain accurate registration of the volume of liquid from the well.

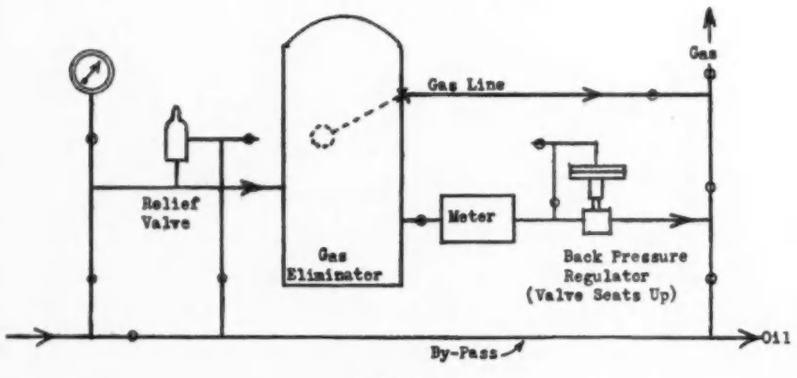

FIGURE 1

For pumping wells or others having a low rate of production, and having a comparatively low gas-oil ratio, the simple set-up shown above, using a single small gas eliminator downstream from the trap, gives very satisfactory results.

Means of Eliminating Gas

To obtain this gas removal the meter must be located in the line downstream from the oil-gas separator. Of importance is making sure that the separator has sufficient capacity to strip the gas from the liquid at the highest rate of flow anticipated. Then the oil line into which the meter is connected must carry a slightly higher pressure than that of the separator, and the temperature of the liquid reaching the meter must be as low or lower than than of the liquid in the separator. At a well where the pressure at which separation of gas and liquid is made at a lower pressure than that carried on the line in which the meter is set—that is the separator must throttle the gas valve in order to discharge oil through the liquid valve—(assuming no temperature increase between the separator and the meter intake), then only liquid will be

delivered to the meter and a correct registration will be obtained. Also, the meter must be set as near the separator as possible, with ample sized pipe between the separator and meter, with no restriction in diameter of piping between the separator and meter and as few turns as possible in the line between the two.

However, if the opposite is true, that is if the pressure at which the separation of gas and liquid takes place is greater than the pressure held on the line in which the meter is set, other steps will have to be taken to insure removal of free gas. Take the case where the flow line pressure is only a few pounds lower than the separator pressure. If the oil being measured has a composition which permits the release of gas without undue foaming and the rate of flow is comparatively small, then an air or gas eliminator can be installed just ahead of the meter for trapping out the gas released between the separator and meter due to the drop in pressure after leaving the separator (Figure 1). This eliminator is merely a small capacity separator which discharges the trapped gas back into the flow line downstream of the meter. It consists of a small pressure vessel in which is installed a float-controlled gas valve. If the meter requires a pound or two of pressure drop for operation at the minimum rate, then the gas will discharge across the meter. With a meter which has practically no pressure drop at low rates, a spring-loaded back-pressure valve must be installed between the downstream side of the meter and the point at which the discharged gas from the eliminator is admitted into the flow line downstream of the meter (Figure 2). In other words, some means must be used for creating a pressure drop in order to force the eliminator gas to flow across the outside of the meter back into the line downstream of the meter or the gas must be admitted to a gas line at the location which carries a lower pressure than the oil line at this point.

Where the type of oil or the rates of flow do not permit the use of the above method, two other auxiliary devices can be used for obtaining correct liquid volumes. One of these is used with the separator elevated above the meter or ground level (Figure 3), and the other one is used when the separator is at ground level (Figure 4). Either of these methods can be used in place of the eliminator and the equipment used will depend on the cost of the various installations.

Assume first, the case wherein the separator is elevated. For convenience in reading, the meter is set at ground level and just downstream of the meter a regulator is installed in the line. The valve in this regulator seats down. Next,

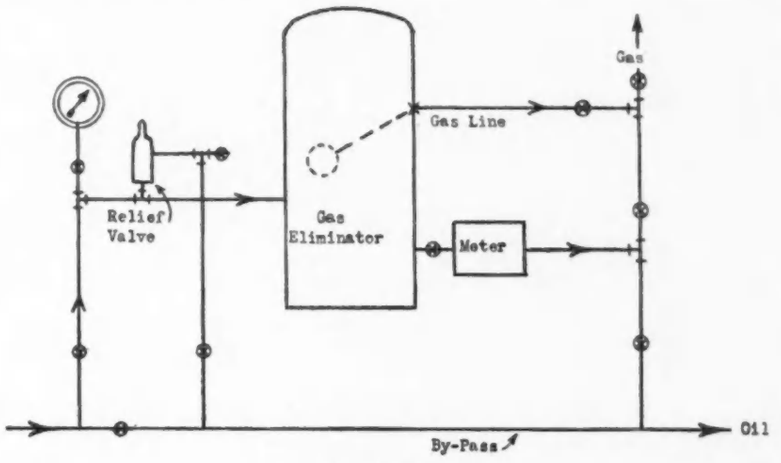

FIGURE 2

Sketch showing how use is made of a spring-loaded back pressure valve to introduce an artificial pressure drop across the meter to permit gas discharged from the eliminator to be admitted into the flow line downstream from the meter. This is used on meters handling low volumes of fluid at little or no pressure drop.

a ½-inch line is brought from the gas chamber of the separator to the upper side of the regulator diaphragm. This side of the diaphragm is also spring loaded with a light adjustable compression spring. From the intake side of the meter another ½-inch line connects the flow line to the bottom of the diaphragm. Enough tension is applied to the regulator spring to back up the liquid leaving the separator to the desired height or as high as is found necessary in order to prevent gas breaking out of the liquid after it leaves the separator. Take for example a case where the separator is elevated 40 feet and the separating pressure is 80 pounds per square inch and the spring tension is such that 5 pounds per square inch must be applied to under side of the diaphragm to start the valve open with the lines to the diaphragm disconnected. The pressure on the downstream side of the meter and upstream of the regulator would be held at 85 pounds per square inch. The power to open the valve would be supplied by a head of liquid which was "backed" in the liquid line from the separator. This liquid seal is balanced by the spring in the regu-

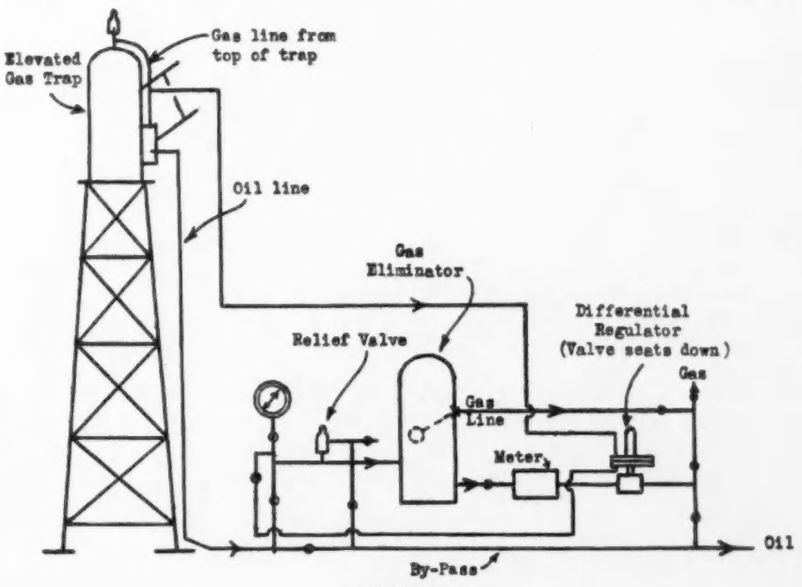

FIGURE 3

Where types of crude or rates of flow do not permit hook-ups as in Figures 1 and 2, the above method, using an elevated trap in conjunction with a differential regulator may be used. Meter is set at ground level for convenience in reading.

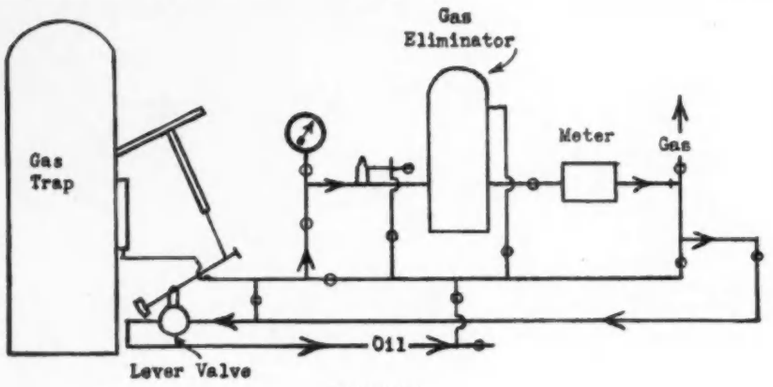

FIGURE 4

When the high pressure trap is located at ground level the above hook-up is recommended, using certain auxiliary equipment. Key to successful operation is use of the balanced lever controlled valve which is installed in the flow line downstream from the oil meter.

lator. When the height of liquid increases, the regulator valve opens, permitting liquid to pass through the meter until such time as the separator stops discharging liquid. At this time the level in the liquid line is lowered and at a point where this head is less than that required to compress the regulator spring, the regulator valve closes.

In the case where the separator is at ground level, a balanced-lever-controlled valve is installed in the flow line downstream of the meter (Figure 4). The lever arm of this valve is mechanically conected to the float arm of the separator. The linkage is adjusted so that the lever valve acts as the oil valve of the separator. This is essentially the same as installing the meter upstream of the oil valve of the separator. In fact, where a separator is installed using a single slide valve on the oil side of the separator to control the liquid level in the vessel, the connections for the meter are installed so that the liquid being metered is always under a little more pressure than the pressure at the surface of the liquid in the separator. In other words, the meter is installed upstream of the oil slide valve.

When dealing with lower-gravity crude oils, that is below 20° API, elimination of gas before metering the liquid becomes more difficult. In many cases these oils cannot be stripped of the gas with gas-oil separators because of the economics of the situation. The expense of a great enough separator capacity is not warranted by the amount of additional gas recovered or by any other advantage obtained by stripping the oil completely of the gas. In many of these cases a displacement meter can be used if conditions permit backing up about 50 pounds per square inch of pressure on the separator and oil meter. This is accomplished by installing a back-pressure regulator in the line downstream of the meter. This regulator is then adjusted, starting with a low back pressure and increasing the back pressure until the meter records correctly. The author gives 50 pounds per square inch as the maximum pressure to use because in most cases the wells producing this oil are pumping, and the polish-rod stuffing box is likely to give trouble if the pressure is carried at a higher point. If a pressure of about 50 pounds per square inch does not accomplish the desired result, the displacement meter cannot be used. In these cases the weigh-type meter (to be described later) is used because the entrained gas does not materially affect its registration.

When applying back pressure to a well, one should always have the casing of the well connected to another system so as not to back pressure the casing with the regulator. In most of these cases, the casing gas is taken direct to the gas-gathering system. Whether or not the back pressuring is successful in eliminating the free gas, of course, depends on the analysis of the oil and in general if it works on one well producing from a formation, it will work on all wells producing from this same formation. Also, it is generally true that the lower the gravity the less successful is the back pressuring as a means of obtaining accurate measurement of the liquid from the well.

Factors Affecting Meter Accuracy

When the separation pressure on the low-pressure separator is high enough to hold an appreciable amount of hydrocarbons in the liquid state, which at the atmospheric pressure will be a gas, the meter will over-register when the metered volume is compared to the stock-tank volume. This error becomes important on high-gravity oils with the gas-oil separation upstream of the meter taking place at several hundred pounds per square inch pressure. To compensate for the presence of this material an analysis must be made of the oil in the low-stage separator and a correction factor applied to the meter, if the meter is to check the stock tank; or a measurement and analysis of the gas recovered by a vapor "trap" at the tank will give the information needed to balance the stock-tank gauge with the meter recording.

Paraffin and asphalt, pasty substances which precipitate out at the metering pressure and temperature, also contribute to the problems encountered in oil metering. This material deposits in the clearances and ports of the meter, and will cause the meter to register inaccurately, finally plugging it to the point where it ceases to operate at a low rate of flow. Once the meter has stopped because of wax it must be cleaned. Connecting the meter intake to a supply of low-pressure steam or hot water will liquefy and displace the wax, making unnecessary dissembling of the meter. There is also a solvent on the market which can be introduced into the meter to remove the wax. This wax usually gives trouble in winter only. It may be present in both medium- and low-gravity crude oils and is most prevalent in the oil from gas-lift wells.

Salt water is another material which the oil-well meter must handle. The majority of wells produce water along with the oil and as the wells become older the proportion of this water to the oil increases. Because most oil-well meters are manufactured to measure crude oil, the water is troublesome for several reasons. The meter clearances for purposes of sealing are adjusted by the manufacturer to suit the viscosity of the liquid to be handled by the meter. Thus, if the meter is made to handle crude oil, the slippage by the seal will increase when water is metered. This is true when the water comes from the gas-oil separator as free water. If the water and oil leave the separator as an emulsion, the seal is usually more perfect than it would be for oil because of the greater viscosity of the emulsion. With free water and crude oil, the inaccuracies involved become greater as the percentage of water increases until a point is reached where it becomes more practical to use a salt-water meter instead of an oil meter. This change is usually made when free salt water constitutes more than 90 percent of the gross liquid handled.

Another approach would be to separate the free water from the oil at the well head and then install two meters—a salt-water meter to be used on the water and a crude oil meter to be used on the oil. This would entail a separating device with each meter location and another system of pipe lines for collecting the waste water. Also, two

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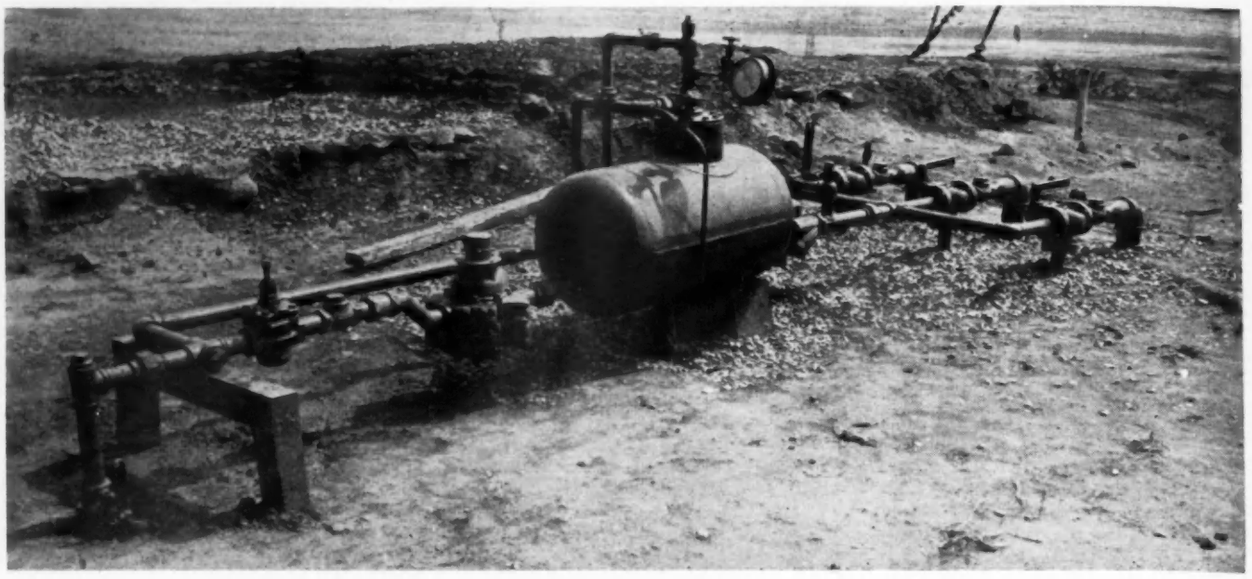


Reciprocating piston type of meter shown connected up to three wells. This meter also requires a gas eliminator. Pistons are double acting, and operate with a rotary valve.

meter readings would have to be added together to obtain the measurement desired. This plan or hook-up of course, entails more expense of installing and it usually has been found more feasible to use the single meter in spite of the greater maintenance required.

Deposition of salt scale in the working parts is still another source of trouble in meters which handle salt water. This is generally not so serious because in most cases oil at some time during the cycle of the meter contacts the working surfaces and to a large extent inhibits the deposition of scale. Lack of lubricating qualities is the most serious trouble from salt water. Meters having heavy and unbalanced working parts wear rapidly at the points of contact.

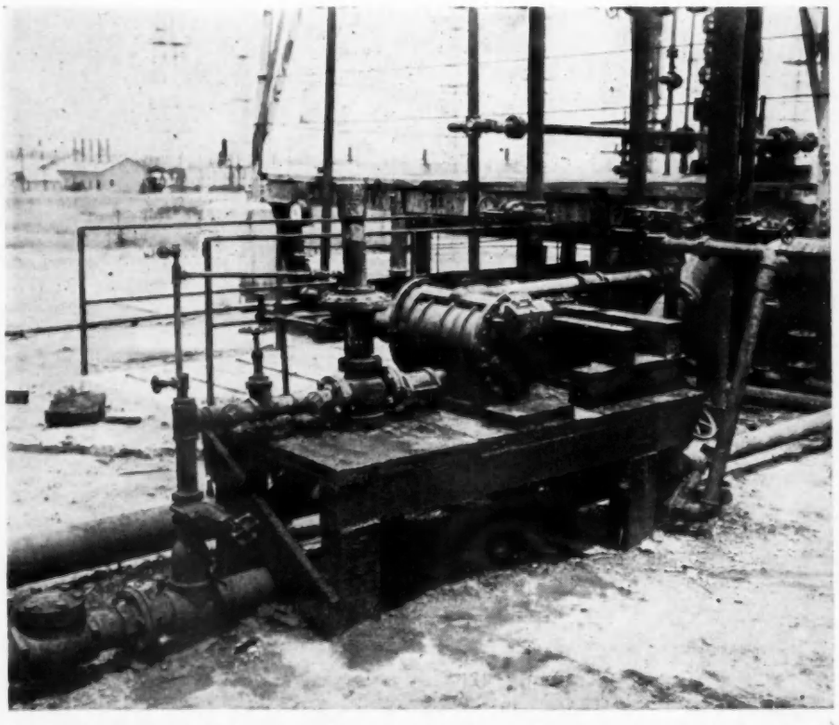
Sand vs. Meter Tolerances

Sand, coming along with the well fluid, offers the most serious handicap in the use of positive-displacement meters. Many wells start to produce this sand from their first day of production. In most localities, however, the sand appears after the flush period in the production life of the pool.

It is readily apparent that meters having close clearances in their working parts will be subject to considerable trouble. Adjusting the clearance to be close enough to hold the abrasive out of the inter-metal spaces is impossible because of the varying grain size of the sand encountered. Some of this abrasive is so fine that 50 percent of it will pass through a 200-mesh screen, so it may be seen that it would be too costly to clear the well production of all the sand ahead of the meter. Best results have been obtained by the use of a small precipitation tank ahead of the oil meter. This tank is usually a combination sand tank and air eliminator. No attempt is made by its use to remove all of the abrasive but in many wells enough can be removed to greatly lengthen the life of the meters.

Such tanks remove the free-running sand material which probably would drop into the measuring chamber of the meter if some place were not provided ahead of the meter where it could drop out of the stream. This arrangement makes it necessary for the meter to handle only the finer particles that are held in suspension in the liquid. Therefore, in conjunction with the tank, special attention should be given to the selection of a meter which will not be damaged too rapidly by this suspended abrasive. Meters best suited for such work are those which do not depend upon metal-to-metal seals.

This type meter will not operate at all in some locations due to the sand present in the well production, and if they do operate, the metal parts wear



Positive displacement meter which employs a single large double-acting piston. Not shown is the elevated trap. Flow diagram of this setting is illustrated in Figure 3.

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We asked them this question that you might profit from their extensive experience with the diversified pumping problems encountered throughout the oil fields of the world, during this period of acute raw material shortages and converted manufacturing facilities.

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1 Keep sucker rods straight. National delivers straight rods at considerable expense, and every effort should be made to keep them straight.

2 Sucker rods should be hauled only on a float and not on a pole trailer to prevent bending and kinking.

3 Ample level skids (at least four) should be provided to assure straightness for rods in warehouse stocks and for surplus rods at the wells.

4 Rods should be racked so that box and coupling ends are even and enough space left between the rods to permit proper spraying.

5 Boxes and pins must not be dragged through dirt when pulling into derrick. Boxes and pins should also be well lubricated and protected from weather.

6 Rod hangers should be used in handling rods in derrick. If derrick is not up, rods should be handled in singles.

7 A clean joint is always easier to make-up and should therefore be inspected and cleaned each time the string is rerun.

8 Make up rods tight with snap wrenches. Care should be exercised to see that only wrenches of proper size are used on the wrench squares.

9 Do not use pipe wrenches on body of rods or couplings. Pipe wrench scars on body of rod and coupling form points of concentration for fatigue, strains and corrosion.

10 When a joint is hard to make-up, do not force. Break-out and use a tap or die. Avoid unnecessary hammering of joints. Do not hammer hardened and ground couplings.

11 Rods should be run without slack so that threads will not become crossed.

12 Be sure that the proper size and grade of rod is being used on each individual well and operate the well within the limitation of the rod specifications.

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rapidly and consequently there is a rapid loss of accuracy. The rate of this wear is retarded as the clearances in the meter are increased by sand cutting. By frequent checks on the meter, it is often possible to increase the speed of the register and in this way maintain a reasonable degree of accuracy. However, this is expensive and there will be periods when the meter will not register correctly. In fact, the registration will be correct only when the rate of flow through the meter and the effective viscosity of liquid is approximately the same as that at the time the correction was made on the register. In other words, the meter ceases to be a positive-displacement meter and tends to become a current-type meter.

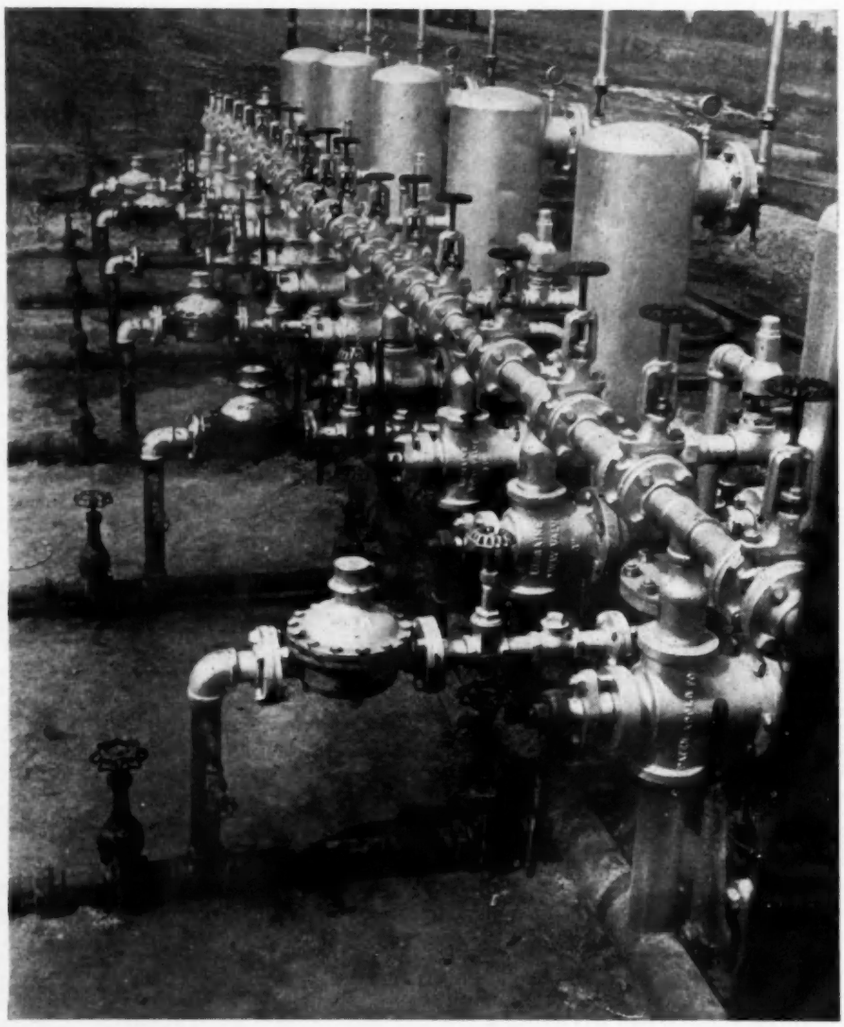
Because of small clearances and the passing of port edges over one another in the operation of this type of meter, all large particles of foreign material must be removed from the liquid before metering. A sediment strainer with a coarse-mesh basket is used for this purpose. An ⅛-inch mesh basket has been found to accomplish the desired results. This mesh will stop such particles as stuffing box rubbers, large pieces of salt and pipe scale and will permit the passing of sand. Any mesh which would stop sand particles would plug in a few minutes. The strainer should be installed upstream of the air eliminator so that any gas released due to partial plugging of the screen can be trapped ahead of the meter.

In most locations corrosive compounds present in the liquid from the wells do not give much trouble. This probably is due to the bathing in crude oil that the working parts receive during the cycle of the meter. Some materials such as aluminum, do give trouble if the water content of the production is high. In any case, the proper selection of materials for the manufacture of the meter can overcome these troubles. Dehydration chemicals are troublesome when introduced upstream of the oil meter, not because of a chemical reaction on the meter parts, but merely because they reduce the effective viscosity of the mixture being handled.

The positive-displacement type meters in use in California at the present time can be classified into the following groups according to their cycle of operation: (1) reciprocating piston, (2) oscillating piston, and (3) nutating disc. Of these, probably the most commonly used at present and the one to which this discussion will be confined, is the reciprocating-piston cycle.

In using this type of meter an important item which has not been mentioned is the necessity of providing a spring-loaded valve in the meter run. This must be present because if, for any reason, the meter jams or stops, the flow from the well will be shut off. The proper point to install this valve is upstream of all the equipment installed in the meter run. Should the meter stall, pressure rises on the upstream side of the meter and after a certain increase, the spring-loaded valve automatically opens and by-passes the production around the meter run.

Most positive-displacement meters do not account for the change in volume of the oil due to a change in temperature, and record only a definite volume per cycle. However, some meters now on the market are provided with a thermostat which causes the meter to register a 60° barrel at all times. These thermostats come with the meters as extra equipment and are expensive in relation to the cost of the meter. They correct on the basis of the expansion factor of the liquid metered. Thus, unless the meter is measuring a relatively dry oil the correction would be in error because of the mixture of oil and water involved. To hold the thermostatic correction accurate, the coefficient of expansion for the mixture would have to be used and an adjustment made whenever a change in composition occurred. The difference in volume between 60° oil and oil at the temperature of metering generally is only about 1 or 2 percent, so it is believed that until such time as this type of meter can be held to closer accuracy while metering oil well production, the thermostat is not essential. In most cases accuracies better than 1 or 2 per cent, although desirable, are not absolutely necessary when handling well production. In places where greater accuracy is necessary, the expense of metering the well production rises rapidly. With the meters now available, this expense would be almost prohibitive if the meters were held to a registration as close as plus or minus ½ of 1 per cent.



Typical oil field installation of displacement meters of the nutating disc type. These meters are equipped with vertical air eliminators. A single large gas separator serves the entire battery, and only two small test gauge tanks serve the wells coming into this centralized location.

Part 2 of this series will discuss the current and weigh type meters, essential auxiliary test equipment, and several compilations relative to cost and maintenance.

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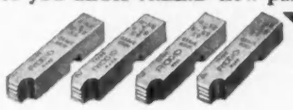

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Conservation of Gas in Louisiana

By H. W. BELL, Director
Louisiana Division of Minerals

OUR nation has reached a time when stricter economy of its national resources is imperative, not only for the duration of the war and the reconstruction period to follow but for all time. We of the areas of more recent development of oil and gas reserves, must lose our sense of security thinking in terms of inexhaustibility and realize that we have passed the peak of our reserves. The statistics show clearly that for several years we have proven up diminishing quantities of oil and gas per foot drilled in unproven areas and the new deposits discovered, usually at greater depths, are now more rarely of major importance.

Research chemists have shown that gas reserves are a most important raw material source for the synthesis of many vital products. This situation is summarized by Information Circular 7108 of the U. S. Bureau of Mines, titled, "Utilization of Natural Gas for Chemical Products." After reading this publication one should be further impressed with the fact that very little natural gas should be wasted. There are of course many cheap sources of hydrocarbon raw materials which may, by the magic of synthesis, and after the economics are solved, be converted into important products. Natural gas, where available at reasonable prices, is a preferred basic material. But before being assigned to use in chemical industry our available gas should no doubt supply our domestic and industrial fuel needs within the range of reasonable economics and where possible the expansive energy of the gas should be utilized before it is finally consumed.

Louisiana currently exports about 390,000,000 cubic feet and imports about 65,000,000 cubic feet of gas daily, a balance of 325,000,000 cubic feet on the export side. Governor Jones has taken a stand against further encouraging the transportation of gas out of the state—his idea is to attract industries that will make efficient use of this gas and bestow maximum benefit to the parent area.

It is the object of this paper to present some of the important facts relative to production and conservation of natural and casinghead gas in Louisiana.

Since about 1920 Louisiana has held high rang among the gas producing states of the nation. Through June, 1942, Louisiana has produced gas as follows:

Natural Gas, practically all metered.....	5,087,647,324,000 Cubic Feet
Casinghead Gas, mostly estimated.....	787,768,776,000 Cubic Feet
Total of Department Reports.....	5,875,416,100,000 Cubic Feet

Using an average of about 1500 gas-oil ratio for oil well production, the estimated casinghead gas is 1.85 trillion cubic feet, and, adding a small percentage to the record of metered gas, a grand total of about 7 trillion cubic feet produced is no doubt a conservative estimate.

This paper was presented in summarized form by the author before a round-table discussion of the Interstate Oil Compact Commission Research and Coordinating Committee, held during the recent Chicago meeting.

The casinghead gas when produced at legal gas-oil ratios may be legally wasted into the air. Usually such potential wastage is materially reduced through lease and plant fuel usage. Some of the fields operate under special orders, which are promulgated after public hearings. In such cases the particular needs of each field are meant to be solved for effective conservation.

The first act of the legislature affecting gas was passed in 1918. Act 268 prohibited "the waste or use of natural gas for any purpose whatsoever in such a manner as will threaten with premature exhaustion, extinction or destruction the common supply or common reservoir from which said natural gas is drawn."

In addition to its ordinary meaning waste was defined as

"(a) Wantonly or wilfully permitting the escape of natural gas in commercial quantities into the open air.

"(b) The intentional drowning with water of a gas stratum capable of producing gas in commercial quantities.

"(c) Underground waste.

"(d) Permitting of any natural gas well to wastefully burn."

The act defined the duties of the Conservation Commission, set the maximum daily flow from a gas well as 25 percent of its potential capacity, dealt with reporting of production to the Department, instructed district judges to charge the grand juries to investigate and report waste of gas, and provided jail and fine penalties.

Act 270 of 1918 stipulated that gas fields should not be produced above the level of market demand without waste and that each well should supply its proportionate share based on capacity and have regard for the acreage it would drain. It also required the use of meters. Chiminal and civil penalties were provided.

Act 91 of 1922 permitted the manufacture of carbon black from natural gas and required the extraction of natural gasoline when the content exceeded 150 gallons per million cubic feet, empowered the Commissioner to promulgate rules, put the enforcement on the Department of Justice and provided only fine penalties.

Act 252 of 1924 was a comprehensive gas act that was designed principally for the important Monroe Gas Field of about 2200 feet depth. Rules for casing and cementing were included. Details of metering were set out. In order to protect the "little fellow" with small acreage a schedule of allowables was adopted as below: One gas well drilled on the following size tracts permits the corresponding volumes.

160 acres allowed	24% of O. F. C.
80 acres allowed	21% of O. F. C.
40 acres allowed	18% of O. F. C.
20 acres allowed	15% of O. F. C.
10 acres allowed	12% of O. F. C.
5 acres allowed	9% of O. F. C.
Less than 5 acres allowed	7% of O. F. C.

except that a minimum of 1,000,000 cubic feet per day per well was allowed providing the working pressure on the casing was held at no less than one half the "rock pressure"

"Hey, Joe! Spool that new line right the FIRST time..."

"YOUR UNCLE SAM'S AIR CORPS uses a lot of wire rope, Joe. Uses it right, too, because wire rope's got a lot of important jobs in this man's flying army: swinging half-ton eggs into bomb racks and towing planes out of hangars —big ropes for the cranes that "walk away" with damaged craft and fine cables for control in the air . . ."

Let's look at it this way: wire ropes, like people, pick up habits quick and easy, lose 'em hard. A wire rope's habits, in the Air Corps or on a drilling rig, begin when it's first spooled off the reel—and *bad* habits in a drilling line mean shorter rope life, sloppy service. When you spool a new line onto the drum, observe the following rules:

Wind the rope with *special care* the first time you do it. A little extra time spent on the first wind will pay big dividends. *Guide the first layer carefully into place.* With a smooth-faced drum, this means to make each turn fit snug against its neighbor *without* interlocking of strands. For best results, the dead wraps must be wound tight against the drum face.

Be sure there's a brake on the reel. This provides uniform winding tension which produces necessary snugness and prevents rope damage due to over travel of reel. Mount the reel as shown in illustration so the rope pulls off the underside. Be sure the rope lead from reel to drum is straight and unobstructed.

By following these simple rules in spooling new line, you'll be helping

that line to work better and longer. With Roebling "Blue Center" Steel Wire Rope, that means getting all the *extra* value built in by Roebling's 100 years of wire-rope engineering, means keeping that wire rope on the job for Victory.

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(closed in casing pressure). This act was passed without any penalty provisions. That deficiency was remedied two years later. Today the Louisiana Supreme Court is considering whether the act has been nullified by Act 157 of 1940. This latter act gives broad powers to the Commissioner of Conservation for the prevention of waste. Its novel feature is his power to force unitization of pools and of individual tracts into drilling units, after public hearing. This part of Act 157 has been attacked and is now under advisement by the State Supreme Court. The appeal suit has reference mainly to the unitization of gas properties into 640 acre drilling units. The State had previously set 320 acre units for that particular pool but voluntarily conformed to the emergency ruling of OPC and WPB, which latter became effective December 23, 1941.

During 1921, two Bureau of Mines engineers made a study of the then young Monroe Gas Field and calculated a gas reserve of about 4.0 trillion cubic feet. Recommendations were made concerning the safe and sane methods of completing and producing the wells. The suggestions were adopted and technical men were hired to supervise these and other operations in the State. Bulletin No. 9 of the Department of Conservation, a cooperative report with the U. S. Bureau of Mines, was the resulting publication.

Previous to this investigation some of the operators had met and seen the wisdom of devising a uniform and safe casing program for Monroe but were not able to get their ideas generally adopted. Through June, 1942, the field has yielded about 3,142,137,151,000 cubic feet and still has a reserve of about 2.0 trillion cubic feet of gas. The original pressure at the surface was 1050 pounds.

Louisiana was undoubtedly the first State to define, by statute, the difference between a gas well and an oil well.

Act 253 of 1924 was drafted as an oil bill. The defining clause was objected to by the Mid-Continent Oil and Gas Association and it was "lobbied out" in the joint Conservation Committee. The bill was re-drafted without the defining clause and was recommended. But whoever placed the bill in the hopper used the original draft and it became a law. The objectional feature was as follows:

> "Wells producing both oil and gas shall not waste or blow into the air an amount of gas of more value at three cents per thousand cubic feet, than the market value of the oil recovered. The Commissioner of Conservation shall allow a reasonable time to determine the status of any well."

Thus if oil is selling for $1.00 per barrel a well can be classed as an oil well as long as its producing gas-oil ratio does not exceed 33,333 cubic feet per barrel. This rule is used today, although there is a possibility that the Supreme Court of Louisiana may decide that Act 253, and also 252 of 1924 have been nullified by Act 157 of 1940.

On January 1, 1937 when Order No. 7 became effective for the Louisiana portion of Rodessa, a Tri-State area, after oil discovery had changed it from a 5-year-old gas field to a combination field, the rule of ratios took on a new interpretation.

A legal ratio of 2000 cubic feet per barrel was set by the order. The total field allowable was set and then the normal well allowables were calculated on the basis of acreage 50% and bottom-hole pressure 50%. A well was allowed to produce its calculated oil allowable provided its ratio did not exceed 2000 cubic feet per barrel. For all ratios above that base ratio the allowable was reduced in proportion. That is, a 6000 ratio well got one-third its normal allowable. Then with $1.00 oil a well owner could demand an allowable with a ratio up to 33,333 even though he could produce only 6% as a minimum of his normal allowable of oil. For each well a top gas limit was set. This was the product of the normal oil allowable and the legal base ratio of 2000. Then the gas limit divided by the producing ratio also gave the actual allowable in barrels. Thus was the casinghead gas production controlled and at once reduced from about 700,000,000 cubic feet to about 50,000,000 cubic feet per day. Later reduction in ratios through work-over jobs and increased taking in to pipe lines resulted in a waste of casinghead gas of only about 44,000,000 cubic feet per day. At the same time (October, 1941) about 62,000,000 cubic feet per day was vented but 18,000,000 of this was high pressure gas from gas wells which had been beneficially used for gas-lift operations in lieu of other artificial lift. The Rodessa Field is multi-zoned. All four main reservoirs contain gas only, in the up-dip portion along the fault. Only the Hill Sand, the shallowest reservoir, does not contain oil (except in minor quantity) down-dip. In order to conserve the reservoir energy of the oil producing strata, Order No. 11 was issued. This affected the three lower zones and provided that gas wells could not produce any more gas than the average of oil and gas production from oil wells producing from that same zone, the volume being measured under reservoir conditions of pressure and temperature. This order had the effect of substantially reducing the allowables of gas wells for all but the Hill Sand. Many gas wells were then changed to Hill Sand production. The result will be increased ultimate recovery of oil as well as increased current allowables of gas to pipe lines.

The abundance of gas in Louisiana is so great that many reservoirs which give promise of only gas production are not developed nor defined sufficiently to allow a good idea of their reserves. Many gas sands occur as multiple zones with oil on defined structures. Although often not produced for gas, the data of the electrical logs serve well in the appraisal of some of these reserves. Using calculable fields the gas reserves total about 8¼ trillion cubic feet. The evidence at hand justifies an addition of one-third or a proven reserve at least 11 trillion cubic feet and the total may reach considerably more.

The production of gas from the beginning is measured, and estimated, to have been as follows:

Natural Gas
Industrial and Domestic.....3,773,684,164,000 Cubic Feet
Made into Carbon Black.....1,426,315,836,000 Cubic Feet
5,200,000,000,000 Cubic Feet

Casinghead Gas
Industrial, domestic, mostly wasted
partly stripped of gasoline...1,800,000,000,000 Cubic Feet
7,000,000,000,000 Cubic Feet

For the first half of 1942 the State produced 226,195,944,000 cubic feet of natural gas, or 1,240,000,000 cubic feet per day. North Louisiana produced 86% of this total. For the reported casinghead gas the 6-months production was about 112,000,000,000 cubic feet, or 614,500,000 cubic feet per day. North Louisiana produced about 31.3% of the casinghead gas while producing about 22.7% of the oil. These data support other data in the conclusion that the deeper and higher pressure reservoirs do not necessarily produce with higher gas-oil ratios.

The total gas from reports totaled about 1,854,500,000 cubic feet per day. The distribution of this output is tabulated in Table I by percentage.

TABLE I

	Sales	Wasted	Gas-Lift	Lease Use	Carbon Black	Misc. Use
Natural Gas ...	79.86	0.95	8.93	4.00	5.35	0.91
Casinghead	46.53	37.25	5.55	8.02	0	2.65

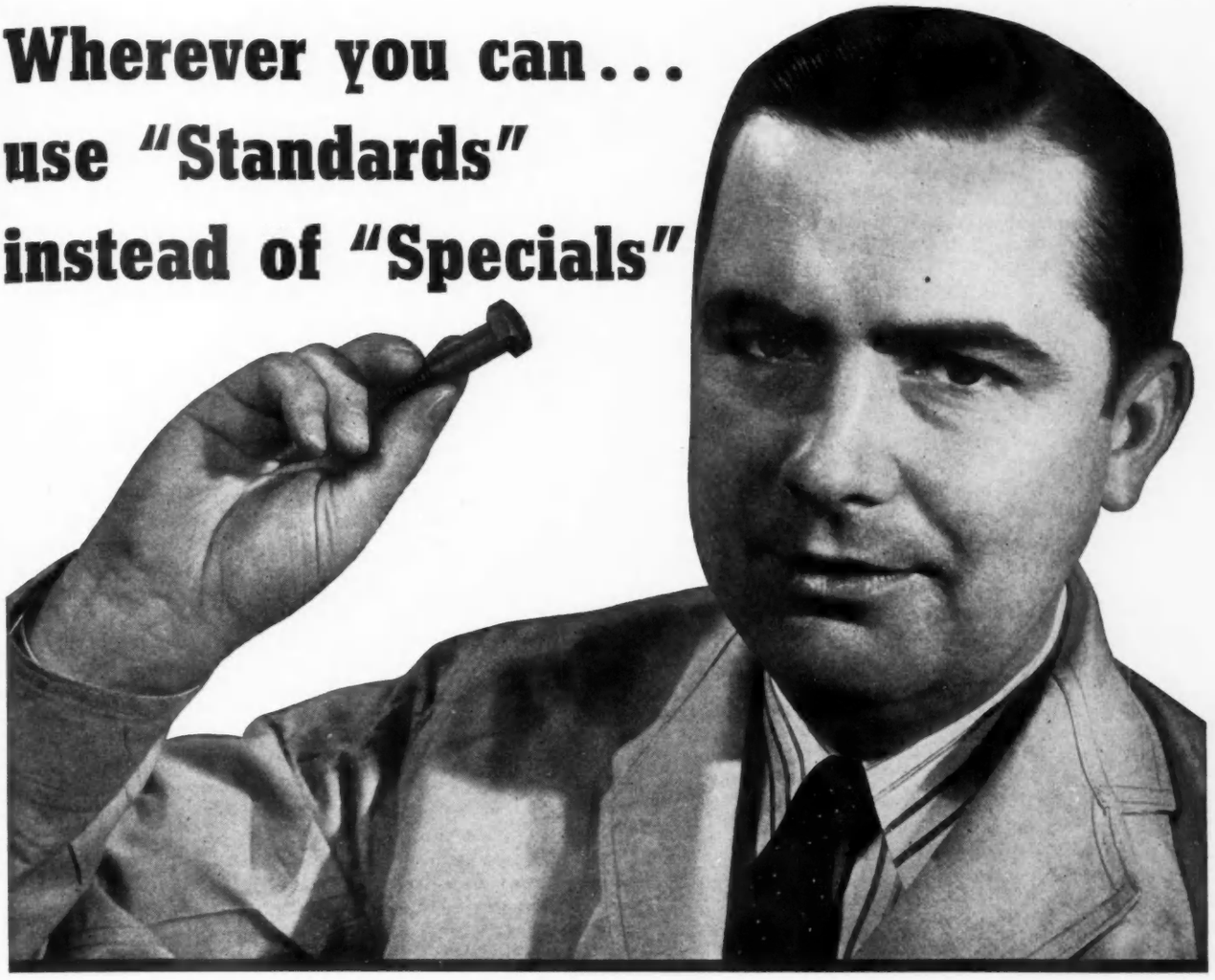
For the first half of 1942 the gas stripped of its natural gasoline through plants was:

46,218,068,000 Cubic Feet Natural Gas
49,312,314,000 Cubic Feet Casinghead Gas
Total 95,530,382,000 Cubic Feet

The natural gasoline recovered was 48,728,400 gallons, or an average of .51 gallons per 1000 cubic feet.

From present data, the gas reserve of the State is divided

Wherever you can... use "Standards" instead of "Specials"



Although special-sized bolts and nuts are often needed, as well as fastenings made from special steels, there are many instances where standard bolts and nuts aren't now being used, but could be.

By using "standards" wherever possible, you help ease the pressure on bolt-and-nut production and relieve the shortage of critical materials. And because "standards" are often available from stock, the chances are you'll receive urgently-needed fastenings sooner.

Let a Bethlehem engineer help you check over your bolt-and-nut needs. There may be a number of cases where he can suggest heat-treated carbon steels in place of hard-to-get alloys. Perhaps he can recommend certain "standards" in place of some of the "specials" you are now using.

Anyway, it's worth a try. Get in touch with your local Bethlehem representative, or write to Bethlehem Steel Company, Bethlehem, Pa.

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about equally between North and South Louisiana. There are no known deposits of sour gas nor of gas with a specific gravity over 0.8. The composition is remarkably uniform and carries a high percentage of methane.

Retrograde Condensation and Cycling

A few years ago physicists learned that there was something more than just oil, gas and natural gasoline as far as the state of matter in the reservoir is concerned and relative to the deeper porous strata where high temperature and pressures are existent. There are critical temperatures for elementary gases and for mixtures and critical pressures are the usual correlatives of these. The discovery of the behavior of mixtures of petroleum fractions under the new conditions imposed by depth was rather startling. The net result is that some of the liquid produced is not liquid in the reservoir, but occurs in the gaseous state, or single phase. Upon sufficient reduction in temperature and pressure, due to production, liquid will form in the reservoir. In so doing the major portion of it will be lost due to capillary forces; the same principle that prevents the recovery of more than about 50% of our crude oil. Then maintenance of reservoir pressure by return of gas after liquid extraction is the remedy for such loss. It is called cycling or recycling. These projects entail high pressure operations. Fortunately an optimum liquid extraction is obtainable thus far with single-stage compression.

In Louisiana high primary prices for gas do not exist on account of the general abundance. But if they did exist a balance would have to be taken to determine whether to sell the gas presently and secure a small amount of liquid incidentally or whether to cycle the gas back into the reservoir, after extracting a larger amount of liquid. The latter of course requires equipment for compression. The returned gas will constitute a comparatively dry gas reserve available for later production. In the cases of currently low prices for gas the stored gas will no doubt be held for more favorable markets.

Louisiana has five cycling projects in operation, the largest of which is located in the Cotton Valley Field of North Louisiana. This plant takes in about 184,000,000 cubic feet per day, sells 21.7%, uses 11.5% in operation and shrinkage and returns 66.8% to reservoir.

The composite figures for the five plants are given below for the first half of 1942.

Gas sold	8,376,903,000 cubic feet	13.0%
Lease and plant use and shrinkage	6,238,325,000 cubic feet	9.7%
Returned to Reservoir	40,594,391,000 cubic feet	63.0%
Vented	9,209,357,000 cubic feet	14.3%
Total Gas First Half '42	64,418,976,000 cubic feet	100.0%

This 64,618,976,000 cubic feet (352,500,000 cubic feet daily) produced 3,161,734 barrels of condensate or about 17,380 barrels per day. The average content has been about 49 barrels per million cubic feet.

Besides the condensate from these operations there was additional valuable liquid recovered, as 341,959 barrels of butane and 42,634 barrels of propane for the first half of 1942. Louisiana claims the deepest producing well in the world, a condensate well of Fohs Oil Company at Delarge near the Gulf. It produces from a few perforations centered at 13,260 feet.

One of the natural laws attending conservation is, the greater the current abundance of a commodity the more profligate will be its use and the greater will be its waste. The cheaper a commodity the less time, thought, and money will be expended in preventing its waste. This is true even in the case of a wasting resource like oil and gas.

Louisiana is blessed with a huge supply of natural gas, certainly in excess of ten trillion cubic feet. The reserve of casinghead gas seems to be of the order of magnitude of 2.6 trillion cubic feet. The gas accompanying the oil has in general, been allowed to waste considerably due to the ready abundance of cheap high-pressure natural gas. Only a minor amount of the low-pressure casinghead gas, remaining after local low-pressure fuel needs were met, has been compressed for use in recent years. At this time Louisiana is shifting toward stricter conservation of its casinghead gas. After compression, this gas can be substituted for natural gas in pipe lines. But the increasing use of this gas for repressuring and pressure maintenance must be had in order to increase the recovery of oil through such well-known aids as maintenance of flowing energy, minimizing viscosity and maximum effect of water drive when present.

Needless to state, at the present time the war has caused a severe shortage of material and machinery to accomplish compression of gas for its further use or return to earth.

The high lights in Louisiana's part in gas conservation are recorded as follows. It began at Monroe with the adoption of engineering practices. The passage of Act 252 of 1924 and the promulgation of a number of new rules under that authority were follow-up tokens of sincerity. Strict enforcement of the law and the rules was undertaken—one of the beneficial results was the correct and honest reporting of natural gas volumes.

For casinghead gas, Act 253 of 1924 served to reduce the wastage of that commodity.

At Monroe the marked reduction of gas burned into carbon black about 1930 was on the side of conservation, the natural gas being diverted to pipe lines and retained as protection of a huge investment.

At Rodessa Field Orders No. 7 and No. 11 served to greatly curtail the wastage of both natural and casinghead gas as many wells had their status changed from "oil wells" to "gas wells."

By means of the power to force unitization the Department has greatly aided in the consummation of cycling projects. That authority is usually not invoked until after plans are well formulated by the operators and a minor number of parties at interest refuse to sign agreements. Thus far the parties forced into unitization have later found it to their advantage. Apparently some refuse to sign on account of ignorance or to maintain a negative position legally or in order to enlist the advice and protection of the State department.

The present plan is to reduce the permissible producing gas-oil ratios and let the low ratio wells produce the bulk of the allowable. It is contemplated to shift allowables from high ratio wells to low ratio wells of the same lease, after the open hearing of relevant evidence. It is intended to establish a normal allowable of oil for each well, based on such factors as depth, acreage, and bottom-hole pressure. The actual allowable set should bear the same proportion to the normal allowable as the base gas-oil ratio bears to the producing gas-oil ratio, when the latter exceeds the former.

On September 26, 1942, a state-wide hearing was held at New Orleans. The Department proposed a base ratio of 1200 cubic feet per barrel, based on data and calculations. The Operators Committee asked for a base of 2000 on general principles. The discussion also included corollary rules. The order has not yet been issued. For fields not under special orders, the depth allowable, modified by aviation types, have applied, with a further modification on a base ratio of 4000 cubic feet per barrel.

The present discussion was brought to a head through the Operators Committee making a promise to Governor Jones to give their earnest support to the saving of casinghead gas in return for his signing a bill that removed the tax on wasted casinghead gas.

Where too much gas is presently wasted from fields under special orders, hearings must be held before new orders may be promulgated.

Increased Rate of Completing Wells Recorded

September brought an acceleration of well completions in the United States, partially in reflection of the relaxation of spacing regulations in Illinois, latest monthly statistics show. In the four weeks ended September 26, there were 1722 completions, equivalent to 430 per week or 61.5 per day. Those averages were about 10 percent above similar figures for the previous month and somewhat above those for July, which had been higher than normally for this year. In August, there were 388 completions weekly or 55.4 daily, while in July there were 416 a week or 59.5 per day. The September averages were the highest since February, when the industry completed wells at the rate of 508 weekly or 72.6 daily.

Increased rates of completing wells were recorded in September in Arkansas, California, Colorado, Illinois, Indiana, Kansas, Kentucky, Mississippi, Ohio, Pennsylvania, West Virginia, and Wyoming. Illinois registered a particularly important increase. As against the 183 completions reported for August by the Illinois Geological Survey, preliminary statistics for August, based on scout reports, show 234 Illinois completions within the four weeks ended September 26.

In contrast with those increases, a decrease in the completion rate was shown for September in Texas, only 74 new wells per week having been reported, against 89 weekly in August.

STATE OR DISTRICT	TOTAL RIGS IN OPERATION (Drilling, Rigs Up, Shutdown)				DETAILS OF OCTOBER 1, 1942 FIELD ACTIVITY					
	Year Ago, Oct. 1, 1941	Month Ago, Sept. 1, 1942	Now Oct. 1, 1942	Percent Change From Year Ago	Rigs in Operation: Drilling	Rigs in Operation: Rigs Up	Rigs in Operation: Shutdown	Prelim. Activity: Derricks	Prelim. Activity: Locations	Total Operations
Alabama	9	2	1	— 88.8	1	...	...	...	...	1
Arkansas	34	23	26	— 23.5	26	...	...	...	19	45
California	273	205	194	— 28.9	105	47	42	...	94	288
Colorado	30	32	31	+ 3.3	12	1	18	...	2	33
Florida	2	4	4	+ 100.0	4	...	...	...	...	4
Georgia	1	....	....	....	....	....	....	....	....	....
Illinois	429	197	232	— 45.9	179	26	27	...	34	266
Indiana	57	51	57	.....	52	1	4	...	26	83
Iowa	1	1	1	.....	....	....	1	...	...	1
Kansas	234	235	198	— 15.3	170	15	13	8	17	223
Kentucky	40	21	25	— 37.5	21	1	3	...	3	28
Louisiana	250	111	104	— 58.4	88	10	6	7	83	194
North Louisiana	108	37	23	— 78.7	20	2	1	1	18	42
South Louisiana	142	74	81	— 42.9	68	8	5	6	65	152
Michigan	154	151	151	— 1.9	78	26	47	4	16	171
Mississippi	36	10	12	— 66.6	11	1	...	1	4	17
Missouri	6	8	8	— 33.3	3	...	5	...	...	8
Montana	82	55	62	— 24.3	30	4	28	...	3	65
Nebraska	32	24	24	— 25.0	15	...	9	...	3	27
New Mexico	126	105	82	— 34.9	48	4	30	...	13	95
New York	125	136	129	+ 3.2	77	25	27	1	...	130
North Dakota	3	1	....	....	....	....	....	....	....	....
Ohio	292	246	242	— 17.1	174	27	41	17	43	302
Oklahoma	373	244	224	— 39.9	180	19	25	17	28	269
Oregon	3	....	1	— 66.6	1	....	....	....	....	1
Pennsylvania	421	412	412	— 2.1	313	48	51	27	73	512
South Dakota	1	3	3	+ 200.0	2	....	1	....	1	4
Tennessee	6	1	2	— 66.6	1	1	....	....	1	3
Texas	1,313	627	624	— 52.4	466	33	125	29	311	964
East Texas Border Co.'s	14	6	10	— 28.5	10	...	...	...	4	14
East Texas Field	20	....	....	....	....	....	....	....	....	....
Rest of Eastern Texas	73	44	49	— 32.8	38	1	10	6	14	69
North Texas	145	92	104	— 28.2	69	3	32	5	88	197
West Central Texas	102	54	44	— 56.8	29	2	13	...	20	64
West Texas	344	189	185	— 46.2	132	10	43	3	74	262
Texas Panhandle	142	54	47	— 66.9	38	4	5	1	13	61
Gulf Coast, Upper	136	66	64	— 52.9	50	6	8	5	40	109
Gulf Coast, Lower	181	90	81	— 55.2	70	5	6	6	37	124
Southwest Texas	96	23	27	— 71.8	22	1	4	2	17	46
South Central Texas	60	9	13	— 78.3	8	1	4	1	4	18
Utah	6	2	2	— 66.6	....	...	2	...	...	2
Washington	1	....	....	....	....	....	....	....	....	....
West Virginia	286	47	49	— 82.8	35	5	9	3	8	60
Wyoming	67	53	53	— 20.8	32	2	19	1	2	56
Total United States	4,693	3,007	2,953	— 37.0	2,124	296	533	115	784	3,852

State or District	MONTHLY COMPLETIONS: TOTAL			Details for September, 1942: New Wells Drilled for Oil or Gas						CUMULATIVE COMPLETIONS: FIRST 9 MONTHS 1942: TOTAL			Details for 9 Months of 1942: New Wells Drilled for Oil or Gas						
	Year Ago, Sept 1941[2]	Month Ago, Aug., 1942[3]	Latest Data (Sept., 1942)[1]	Oil	Gas	Distillate	Dry	Others[6]	Old Wells Drilled Deeper	Total Footage Drilled	1941[4]	1942[5]	Percent Change	Oil	Gas	Distillate	Dry	Others[6]	Old Wells Drilled Deeper	Total Footage Drilled
Alabama	1	2	.....	....	....	..	....	....	.....	.....	2	3	+ 50.0	....	....	..	3	....	.....	4,697
Arizona	....	....	....	....	....	..	....	....	.....	.....	....	2	.....	....	....	..	2	....	.....	6,662
Arkansas	14	10	15	7	....	..	8	....	.....	88,696	123	99	— 19.5	62	....	1	36	....	.....	596,246
California[7]	98	40	54	40	....	..	14	....	.....	199,788	840	540	— 35.7	325	8	..	189	....	18	2,676,619
Colorado	3	1	2	1	....	..	1	....	.....	13,104	14	10	— 28.5	5	1	..	4	....	.....	51,634
Georgia	....	....	....	....	....	..	....	....	.....	.....	1	2	+ 100.0	....	....	..	2	....	.....	6,519
Illinois[8]	469	[9]183	234	120	3	..	94	....	17	577,701	2,850	1,571	— 44.8	826	12	..	635	22	76	3,947,343
Indiana	50	34	31	12	....	..	16	....	3	48,759	401	288	— 28.1	102	14	..	156	....	16	473,489
Iowa	....	....	....	....	....	..	....	....	.....	.....	5	....	.....	....	....	..	....	....	.....	.....
Kansas	235	176	141	88	10	..	40	....	3	456,619	1,673	1,229	— 26.5	662	61	..	443	9	54	3,751,859
Kentucky	50	13	16	5	2	..	8	1	.....	24,207	246	111	— 54.8	38	2	..	64	2	5	153,453
Louisiana	200	81	61	40	7	..	14	....	.....	404,550	1,114	729	— 34.5	481	21	7	220	....	.....	4,880,754
North Louisiana	98	35	28	18	6	..	4	....	.....	110,595	450	331	— 26.4	224	10	3	94	....	.....	1,357,295
South Louisiana	102	46	33	22	1	..	10	....	.....	293,955	664	398	— 40.0	257	11	4	126	....	.....	3,523,459
Michigan	96	68	50	22	7	..	21	....	.....	136,951	613	510	— 16.8	250	61	..	198	....	1	1,295,185
Mississippi	23	7	12	2	....	..	10	....	.....	67,329	140	88	— 37.1	35	....	..	52	1	.....	464,150
Missouri[10]	11	4	2	....	....	..	2	....	.....	2,504	59	23	.....	....	3	..	20	....	.....	15,808
Montana	15	35	10	7	1	..	2	....	.....	22,767	144	147	+ 2.0	95	35	..	17	....	.....	329,541
Nebraska	10	1	1	....	....	..	1	....	.....	3,500	66	28	— 57.5	11	....	..	16	....	1	66,072
New Mexico	43	42	30	21	....	..	9	....	.....	90,522	278	302	+ 8.6	203	9	..	84	....	6	841,301
New York	147	138	118	64	1	..	4	49	.....	166,513	729	935	+ 28.2	525	4	..	5	401	.....	1,225,674
Ohio	223	95	106	16	55	..	30	....	5	250,884	1,284	828	— 35.5	177	380	..	245	7	19	1,921,781
Oklahoma	254	131	97	44	5	..	34	1	13	309,717	1,638	1,086	— 33.6	478	65	..	414	26	103	3,293,490
Pennsylvania[11]	361	346	360	170	28	..	9	151	2	600,136	2,981	3,045	+ 2.1	1,435	220	..	80	1,286	24	5,056,449
Tennessee[12]	2	1	....	....	....	..	....	....	.....	.....	16	8	— 50.0	1	2	..	5	....	.....	12,240
Texas	1,162	447	297	173	16	4	101	....	3	1,299,285	7,731	4,233	— 45.2	2,635	130	48	1,277	37	106	17,552,189
E. Tex. Border Co.'s	5	2	3	1	2	..	....	....	.....	18,019	23	12	— 47.8	4	5	..	3	....	.....	65,806
East Texas Field	38	1	....	....	....	..	....	....	.....	.....	437	16	— 96.3	10	....	..	5	1	.....	54,498
Rest of East Texas	70	48	26	15	2	..	8	....	1	137,161	396	303	— 23.4	179	6	7	102	3	6	1,463,764
North Texas	241	80	50	23	....	..	26	....	1	152,898	1,843	715	— 61.2	313	5	1	326	31	39	1,835,885
West Central Texas	67	33	17	3	2	..	11	....	1	40,258	464	280	— 39.6	106	17	..	146	....	11	616,264
West Texas	287	111	70	57	2	..	11	....	.....	288,512	1,700	1,173	— 31.0	961	13	..	160	....	39	4,897,425
Texas Panhandle	96	29	25	16	7	..	2	....	.....	79,214	499	309	— 38.0	239	49	..	15	....	6	925,998
Gulf Coast, Upper	69	52	18	9	....	1	8	....	.....	133,411	575	363	— 36.8	232	13	5	112	1	.....	2,441,779
Gulf Coast, Lower	172	64	53	38	....	3	12	....	.....	321,010	967	648	— 32.9	421	14	34	176	....	3	3,873,248
Southwest Texas	82	23	30	11	1	..	18	....	.....	113,004	619	330	— 46.6	146	6	1	174	1	2	1,147,143
South Central Texas	35	4	5	....	....	..	5	....	.....	15,798	208	84	— 59.6	24	2	..	58	....	.....	230,379
Utah	1	....	....	....	....	..	....	....	.....	.....	2	....	.....	....	....	..	....	....	.....	.....
Virginia	....	....	....	....	....	..	....	....	.....	.....	....	1	.....	1	....	..	....	....	.....	1,113
West Virginia	97	72	70	8	43	..	9	....	10	192,878	525	560	+ 6.6	81	363	..	69	....	47	1,652,374
Wyoming	14	12	15	15	....	..	....	....	.....	57,482	102	73	— 28.4	56	3	..	12	1	1	270,921
Total United States	3,579	1,939	1,722	885	178	4	427	202	56	5,013,892	23,577	16,451	— 30.2	8,484	1,394	56	4,248	1,792	477	50,547,563

[1] Wells completed in 4 weeks, or 28 days, ended September 26, 1942. [2] Wells completed in 5 weeks, or 35 days, ended September 27, 1941. [3] Wells completed in 5 weeks, or 35 days, ended August 29, 1942. [4] Wells completed in 39 weeks, or 273 days, ended September 27, 1941. [5] Wells completed in 39 weeks, or 273 days, ended September 26, 1942. [6] Water input, gas injection, and salt water disposal wells. [7] California figures from American Petroleum Institute except for September, 1942. [8] Data on new wells from Illinois Geological Survey beginning January, 1942, except for September. [9] Illinois statistics for August revised to embody State Geological Survey data on new wells. [10] Figures from Missouri Geological Survey. [11] Bradford and Kane-Clarendon, Pennsylvania, figures from The Producers Monthly. [12] Figures from Tennessee Division of Geology.

[*Continued from page 12*]

"3. Oil-field equipment must be carefully guarded against raids from other industries that are no more essential to the war effort than oil.

"4. Tax provisions for percentage depletion charges and for the expensing of intangible development costs must be retained.

"5. Exploratory work on, and development of, public lands should be encouraged by placing those operations on at least as favorable a basis as operations on private lands.

"6. It will not be possible to hold our oil supplies in full readiness for war demands unless new oil discoveries are increased at least to the level of current production as soon as possible.

"7. The oil industry is now dissipating its crude oil reserves—an irreplaceable asset—at prices below replacement cost.

"8. An increase in the price of crude oil is the only way to eliminate the current serious threat to the nation's oil economy."

At the conclusion of the day's session, Brown summed up the developments so far with respect to prices and a suggestion by Henderson that some sort of subsidy was being considered as an incentive to exploration.

The suggestion of a subsidy, Brown said, came as a surprise to the industry, since no such idea has heretofore been broached although proposals for price increases have been pending for more than a month.

Summarizing the arguments of the industry, he said an increase in crude prices is needed for the following reasons:

1. Much of the oil is now being produced at costs exceeding the OPA ceiling.

2. To supply the necessary funds for exploration and to provide the incentive to operators to engage in such activity.

3. To supply funds sufficient to make possible the development of secondary-recovery programs in areas where present prices are not sufficient to provide funds and incentive.

4. To encourage and provide funds to carry on research to develop means of making available the reserves not capable of being recovered under present known methods.

5. To provide necessary funds to enable the industry to keep in its employ the trained and skilled workers, in competition with other industries less necessary to the war effort.

The plea for better prices, Brown said, has been supported by members of the oil industry, the coordinator and his staff, the industry war council, the Interstate Compact Commission, the National Association of Regulatory Authorities, and the various industry associations.

Against these specific needs, he said, the proposal for a subsidy is unsound and improper because:

1. The program suggests a resolution in our political philosophy which seems neither necessary nor desirable.

2. The suggestion is untried in relation to the oil industry and its success uncertain.

3. The time required to invoke such a program might postpone the satisfaction of the requirements of the industry to such an extent as to render it unable to meet the actual needs for war.

4. The novelty of the program suggests difficulties "too numerous for our immediate comprehension."

"Whatever money is to be obtained under this program must be obtained by the producer as a suppliant," Brown said. "He must please some officers now unknown by methods not now understood to accomplish some indefinite purpose, the success of which is at best uncertain.

"The question involved here is too important to the success of our country for us to lay aside the considered judgment of the vast group of responsible and experienced witnesses who have recommended a proper price increase for the doubtful and unexplained program of some uncertain or inexperienced advocate.

"There is no inflation in returning an industry to its normal state of activity in order to prevent its death by artificial deflation."

Henderson Against Increases

During the session, Henderson made it clear that he would not countenance an over-all increase in crude prices but indicated he would be receptive to requests for increases in individual cases.

He outlined the OPA position by explaining that an over-all increase would apply to all producers, large and small, in wildcat and proven areas, and an increase of, say, 50 cents a barrel, on total production of 4,000,000 barrels a day would entail a vastly greater sum than a similar increase in restricted cases whether either the cost of producing was high by reason of distance from market or drilling expenses were heavier than average.

Henderson pointed out that it might be possible to increase prices on a selective basis at a cost of $250,000,000, which would be sufficient to stimulate production in wildcat areas, whereas an over-all increase might cost as much as $750,000,000.

"The only sensible thing to do is to increase prices on an over-all basis," Roeser contended when asked for an opinion by Senator O'Mahoney, pointing out that the price index of oil and products today is only 59 percent of parity and contending that an increase of even 50 percent in price would not be inflationary.

"The prime need for petroleum in our war efforts, the critical supply of materials needed for oil-field construction, and the disturbingly small quantities of new crude oil reserves being discovered all point to the extreme necessity of obtaining maximum recovery of our presently known crude oil reserves," Coordinator Ickes told the subcommittee at its October 7 session.

So far, he said, the industry has been able to meet all military demands, but has done so at heavy cost to itself.

Production of 100-octane aviation gasoline has been boosted to two and one half times what it was thought a year ago could be produced, largely as a result of inter-refinery exchanges necessary to the adoption of proper blending practices and by converting existing equipment to the production of aviation-gasoline blending materials, he told the conference.

This has made it possible for the refiners to keep abreast of demand for the most critically needed product without resort to large quantities of new materials, but another problem which now is causing OPC concern is that of the change in refinery yield to reduce gasoline output and increase that of heating and industrial oils.

Refiners' Financial Burden

Ickes expressed doubt as to how much longer the refiners can continue to bear the resulting financial burden or how much further they can change yields without some arrangement for compensation.

"The reason, of course, is quite manifest," he said. "Gasoline is the profit crop from crude oil; heating and industrial oils are the low-price products. In fact, they are, in effect, subsidized by gasoline. So, when a refiner is asked to make less and less of his high-value product, and more and more of the low-value product, his net returns diminish to the vanishing point.

"Now, even the largest and most financially stable companies cannot operate on such a basis indefinitely. Under present circumstances, the smaller ones are quite unable to survive. They are faced with the alternatives of going out of business altogether, or consolidating with their larger competitors.

"I am sure that you share with me

The "SECRET"

OF EFFECTIVE EXPLORATION WORK:

. . . is found in the simple formula of using experienced crews, giving them thorough methods of procedure and improved instruments to use . . . plus careful supervision.

the conviction that such a condition must not develop if we can possibly avoid it. Not only would we lose the productive capacity of these small refiners—urgently needed in the war—but we would, in effect, be responsible for the development of a monopoly which is repugnant to our conception of free enterprise and equal opportunity."

The matter has been taken up with both OPA and RFC, he added, but so far neither agency has felt it could undertake the responsibility.

There are only two areas on which the government can call for substantial additional sustained rates of production, the coordinator said. Those are the Texas Gulf Coast and West Texas-New Mexico. Production in other areas has already been increased to the maximum or is declining, and efforts to expand it will result in unwarranted loss of reserves and excessively rapid decline of productive capacities.

"I am disturbed particularly by the results of oil finding during the last three years," he said. "While the number of fields found has been considerably increased, their average size has greatly diminished. The result is that while the figures show some increase in our net reserves, the increase has not been as rapid as in previous years. Perhaps the national domain has been pretty thoroughly hunted over by the methods we have been using, and we must perfect some new way of finding oil which will locate fields that now escape our net.

Disruption of Transportation

"The dislocation of our oil transportation system, resulting from enemy action, has thrown a heavy load on our producing facilities in some areas and placed severe limitations on the movement of oil out of the other areas. Our reserves of oil are thus being drawn upon in an uneven manner, with the result that some fields are being produced at rates that would be considered excessive in peacetime.

"To sum up, we are face to face with a situation where, to be on reasonably safe ground, we must take every possible measure to stimulate the search for new oil reserves. And, of course, everything possible must be done to assure the development of that which we already have on an orderly basis, in accordance with sound conservation practices."

Wildcatting, the coordinator contended, depends upon three major elements—the price of oil, the availability of lands suitable for exploration and "the kind of tools we possess with which to do to the job."

"As to price," he said, "the industry has found, by experience, that an increase in the price of crude oil was an effective stimulant of prospecting and a consequent increase in the number of new fields discovered. This is understandable because higher prices naturally attracted more venture capital into the oil business. And I need not remind you that wildcat wells are drilled only by a prosperous industry, with money which can be earmarked for probable loss.

"Of course, we must remember that the financial position of the oil industry is now affected—and will continue to be affected—by the numerous controls of a wartime economy. Rationing of the use of gasoline will make serious inroads into the industry's income. Sharp increases in the costs of labor and materials will cause operating margins on many properties to vanish. Taxation will take a much larger slice of any profits that are left, and will leave less resources to be used for exploration. All of these factors need to be considered in any effort to encourage the discovery of new petroleum reserves.

"I sincerely believe that the price structure might well be reviewed, and that representations from the industry—some of which have already been made to the price administrator — should be carefully weighed. It may well be that price advances should be made at this time in the light of present-day costs, and to stimulate much-needed new development. The OPC is prepared to collaborate with the price administrator in an analysis of this problem.

"Special assistance in the form of higher priorities on the materials required should and is being extended, of course, in the case of exploratory wells which are to be drilled on promising locations. This is and has been one of the foundation stones of our policy. Yet our experience continues to be that of consuming more crude oil than we are discovering to take its place."

Development of many areas where structure favorable to the occurrence of oil is present has been retarded because of diversity of ownership of oil rights, particularly in some districts where reserves are being depleted rapidly, Ickes said, explaining that OPC is preparing to study the ownership of oil rights in certain such areas in the hope that cooperative exploration may be undertaken by the owners. "If the result is the drilling of more test wells on favorable structures, then our studies in this regard will have been well worth the time and effort," he added.

WPB "Quibbling"

"Quibbling" by WPB was suggested by Senator Murdock as possibly one reason why prospecting was not increasing. He referred specifically to reports issued by the Bureau of Mines after exhaustive investigation, recommending certain actions, which, he said, WPB would not follow unless the approval of "the National Academy of Sciences" was first secured.

"You can't get anywhere on oil, copper, magnesium, aluminum or any other product vital to this war program unless you can do away with the quibbling we find over at WPB," Murdock said.

Present prices of oil make it more profitable to many operators to abandon stripper wells and sell the material than to keep on producing, it was declared by Ralph T. Zook, Bradford, operator and Pennsylvania vice president of the National Stripper Well Association.

Reports from the California association, he said, show there is an increasing upward trend in abandonments there which will not be halted until a better relationship is established between price and cost of production.

The salvage value of a typical California stripper well is $2,859, he said, and since the typical well produces but 4 barrels of oil a day, selling for 83 cents a barrel, with the cost of operating closely approximating the selling price, there is a definite inducement to abandonment.

In Kentucky, an operator can realize a salvage value of $400 a well—more than the cash income from the average well over a period of six years. In Michigan the salvage value would be over $3,000.

Abandonment of stripper-well production means not only the permanent loss of large reserves of oil but also a loss in the tax revenue of the states, Zook pointed out.

Only through secondary - recovery methods will the full value of the oil reserves be obtained, he explained, but the present price of crude only allows development of the shallower formations and then only in selected areas where the recovery or price is far above the average.

Present secondary recovery methods will not secure maximum withdrawal, he said, and new methods are being developed. One departure is being tried out in Pennsylvania, in the form of a "mining" operation.

Failure to supply the oil needed for the war program will necessitate a reduction in the scale of military operations, which might prove disastrous, it was warned by D. R. Knowlton, OPC Director of Production, in outlining the

steps taken by the oil agency to keep the industry moving with a minimum of materials.

Knowlton declared that already, in many areas fields are producing at a rate in excess of maximum efficiency capacity which, if carried on, can only result in "an irrevocable loss of petroleum reserves and in an excessively rapid decline of the productive capacities."

"The critical situation with regard to our supply of petroleum, together with current shortages of steel, requires that every precaution be taken to provide for orderly development of the presently known petroleum reserves that are not now developed," he said.

At the opening of the October 8 session, Chairman O'Mahoney read a telegram from Wayne Johnson, WPB representative in the group, criticising the generality of the suggestions that had been offered to deal with the situation and suggesting revival of the 1918 plan of "rewarding" new production.

"It seemed to me that the suggestions thus far submitted to bring about the necessary exploitation of existing prospective and unknown deposits of oil and gas were too general in their application," Johnson said.

"In order to avoid a similar threatening shortage in 1918 the Congress adopted a reward for the bringing in of new wells. To be sure, the situation today, due to critical materials and changes in the industry, make the law and regulations as then adopted not entirely appropriate for the present situation but it gives a guiding principle. I wrote the regulations under the 1918 act and subsequently saw the administration of the act work perfectly, and with modifications it could be equally or more effective today.

"My suggestion is, that in the case of mines, oil and gas wells brought into production by the taxpayer on or after November 1, 1942, and not included in a square surface area of 40 acres having at its center the mouth of a well producing oil and gas in commercial quantities, the depletion allowance shall be based upon the fair market value of the property at the date brought to production or within 30 days thereafter, such allowance in all the above cases to be made in accordance with the annual production, limited to the estimated life of the property, under rules and regulations to be prescribed by the Commissioner of Internal Revenue with the approval of the Secretary, which allowance shall not be less than the 27½ percent otherwise provided in the present revenue act.

"In the absence of a stronger showing than has already been made, I am opposed to general price increases," Johnson declared, "but I do think the areas now where production and consumption are practically in balance and the possibility of a shortage is more imminent, such as the Rocky Mountain States and West Coast, that new production obtained after November 1, 1942, should receive a higher price, due to greater costs and as a further stimulant to production. There is no accounting problem really involved in such a price increase because the runs to the pipe lines are always measured and the wells where oil is used on the property have settling tanks which are gauged each day.

"Neither of these proposals would affect the Treasury's revenue because they have to do with new production, so they would not impair the present estimated revenue returns, would stimulate the production of highly critical and much needed raw materials and produce additional revenue as well.

"Discussion of these principles certainly cannot harm the situation and it seems to me offers a tried solution without involving subsidies which are difficult to administer, and general price increases which would be very difficult to justify."

Steps taken by the Office of Defense Transportation to deal with the oil situation were outlined by Director Joseph B. Eastman, who disclosed that plans for the construction of 500 wooden barges have been hampered by the inability to get motive power. The same lack of necessary towboats, he said, will make it impossible to convert more than half of the available dry cargo steel barges which it had been hoped to put in the oil trade.

Eastman told the conference that while the lake tankers are too large to be moved, it is planned to take the canal boats off the New York State Canal before they are frozen in and use them in lower New York State and New England during the winter.

He commended the industry, the OPC and the railroads for their handling of the tank-car traffic, and called attention to the fact that the carriers cut their oil rates materially—so sharply, in fact, that they now are desirous of securing an increase in the rate on crude.

Under the agreement whereby the government takes on the excess cost of delivering oil overland into District 1, he said, the Reconstruction Finance Corporation is spending approximately $750,000 a day.

Eastman briefly outlined the pipe-line program developed by OPC, leading O'Mahoney to ask whether a line could not be built from northwest Wyoming into the Pacific Northwest to open a market for Wyoming black oils where they are badly needed. Allen said that OPC has received a number of "very definite" proposals for such a line, which are being studied, but that the Northwest Pacific market for Rocky Mountain oil has not been fully developed.

Illinois production already is increasing as result of the relaxation September 1 of OPC spacing regulations, it was declared by A. K. Swann, representing the Illinois - Indiana - Kentucky operators.

In the past two months, Swann said, drilling permits taken out have doubled and output has increased 20,000 barrels daily over the summer low.

Swann declared a general increase in price offered the only real incentive to increased exploration, explaining that this would give operators immediate cash which would be spent on wildcatting rather than be turned in as taxes.

"Price increase is the only answer to the problem," he said. "The only place where a subsidy for new production would be workable would be in nonprorated states, and the only successful subsidy would be a well subsidy under which the government would agree to pay the wildcatter a certain amount per foot for footage completed and wells plugged—dry hole money, as it is called in the industry—with a subsidy on production in the case of successful wells."

The Illinois basin representative asserted also that production of tubular goods is needed if development is to continue, leading the conference into a general discussion of that subject.

PIWC Chairman Boyd, attending the meetings after the close of the council sessions, agreed with Swann, explaining that the council only the previous day had been told by WPB officials that the industry was in direct competition with all other demands for war materials and its needs would have to be adjusted on the basis of the overall picture.

"If we are going to do this war job, we have got to have materials," Boyd said, agreeing with O'Mahoney that the industry now is not getting all the materials it needs.

Allen admitted it was true tubular goods are not being produced, but pointed out that the steel that would be used for that purpose is being dumped on the enemy in the form of bombs and shells. The OPC, he explained, has engaged in a number of activities designed to make maximum use of such materials as were available

either in the hands of supply houses, the oil companies themselves, secondhand dealers or elsewhere, and said his agency now is undertaking a broad reclamation program designed to bring old, obsolete and idle equipment back into service.

The OPC is making a survey of tubular goods in the hands of the companies with a view of distributing idle equipment, he said, but pointed out that the operators have been drawing on stocks for the past two months and such inventories are melting away.

E. E. Robbins, sitting in for Johnson as WPB representative, asserted that there is a substantial inventory of equipment in the hands of the industry, and the problem is one of redistribution. "There is no intention on the part of WPB to deprive the industry of steel and they are getting steel every day," he declared.

Swann criticised the proposed nationwide gasoline rationing as seriously affecting the oil industry, declaring that the need for gasoline is far greater than can be secured under the proposed rationing system. The average Illinois operator, he said, travels some 30,000 miles a year.

He told the conference there is no need for conservation in Illinois because there is neither gas nor hydrostatic drive in the horizons of production. A new move is under way to secure proration, he said, but there is no necessity for such a step.

In addition to a price increase and provision of steel, Swann listed as needed for expansion of exploration the lifting of existing restrictions on drilling, adoption of a definite program for at least one year to justify the assembling of experienced drilling crews, coordination of draft board policies with respect to the calling of skilled oil-field labor, retention of the depletion allowance, development of transportation facilities for new areas of activity, and intensified development in areas nearest to points of consumption.

Henderson answered Brown at the October 9 session, reiterating his determination to make no general price increase, and taking sharp issue with the IPA counsel's statement that a subsidy represented a new political philosophy which might be used for political purposes.

At the outset, Henderson asserted he held no doubts of the adequacy of the petroleum supply to meet all current and prospective war needs, except at specific points, such as California. "Nothing in the supply and requirement picture makes it a matter of worry about crude in the next few years," he declared. He told the conference that he is equally interested in a program for the expansion of reserves.

Chairman O'Mahoney questioned Henderson's confidence regarding supply, telling the OPA chieftain "that sounds unexpectedly like statements we heard a year ago that there was plenty of steel and plenty of aluminum." But Henderson held his ground, saying that the bottlenecks are in the facilities for the production of toluol, high-octane gasoline and synthetic rubber bases.

"There is nothing in the report of earnings of oil producers, as we have them and nothing in the cost studies, as they have come to us to date, to warrant a general increase in the price of crude, and for that reason I see no justification for a general increase," Henderson asserted.

"That is not to say that upon a showing of necessity for a price increase, perhaps in California if we should have a need for increased production of heavy oil for asphalt or if there should be something similar to the Pennsylvania situation where we granted an increase after examination of costs and needs that we would not respond similarly on this product as we have in the administration of prices of other products.

"I can't for the life of me see that the addition of half a billion or one billion dollars to the cost of petroleum products to the government and to the consumers for the purpose of encouragement of wildcatting," he continued. "As I indicated before, I believe that there are more profitable and direct ways. One has been suggested by Wayne Johnson. So far as the government lands are concerned, if the government wishes to encourage exploration it might suspend the acreage charge or might suspend or modify the royalty charges, or we might so far as production is concerned, work out some similar method that we have with differential prices of other commodities. The treasury might give some encouragement by changes in tax laws.

"I do not think I shall ever be deterred from trying to do the job imposed on me by a suggestion from any source that a program that I may recommend was a revolution in political philosophy and something different. I shall not be led into any kind of mudslinging. I shall not try my case by going into the matter of whether or not the oil industry has done its full duty to the public or anything like that."

Henderson asserted that OPA and WPB at all times have the importance of oil in mind, and pointed out that WPB had allocated 180,000 tons of carbon steel to the mining and oil industry for the current quarter, cutting the amounts given other non-military industries to get it.

Sharply rejecting any intimation that the oil industry was seeking to profiteer, Boyd declared that "the industry has no right to profiteer during this war emergency and is not attempting to profiteer, but we cannot perform service as an army with too many casualties."

The industry, he said, has the responsibility of making its case and presenting it to the government agencies and then "we are 'at the mercy of Tiberius'."

Henderson's statement followed the testimony of W. B. Heroy, OPC Director of Reserves, who warned that the present rate of production cannot be maintained over a lengthy period from fields now producing. Heroy pointed out that 75 of the largest fields produced only 75 percent as much oil in the first half of 1942 as in the corresponding period last year, and declared that "maintenance of production at present levels makes it necessary to constantly replenish underground reserves by discovery of new fields."

Urging that conservation measures be made even tighter, he commented that to permit waste now may threaten our supply in later stages of the war. "Saving a barrel of oil that we have already found is less expensive in materials and manpower than searching for new oil to replace it," he said.

Heroy, giving figures on discoveries during the past few years, said the wildcatter has not been less successful in finding new fields but less successful in finding new reserves. To encourage exploration, he said, landowners who impose onerous terms for leases must revise their thinking. It is vital to the war program that the search for new reserves be made financially possible, he said in outlining the needs of the situation.

The industry is faced with the problem of carrying on exploration with less men and materials and under greater difficulties and the government should permit cooperative efforts that would not be permitted normally; there should be a searching review of geological and geophysical data, full-crew operation of technical personnel and no duplication of effort; compilation of geological, geophysical and exploratory data; correlation of geophysical surveying, and a study of prospects now under lease and early testing of such areas.

A BUSINESS BUILT ON SERVICE

to our industry . . . for our country

Our story reflects, especially in times like these, what a group of people with a sincere desire and purpose can accomplish in Free America.

Our purpose in business was to offer to the trade the best products and service we could give. We must have succeeded, at least in the eyes of our own industry, since continued and increased patronage enabled us in twelve years to grow from one small field shop to six major manufacturing and service plants . . . from one truck to a fleet of more than 60 modern service trucks and field cars . . . from four employees to a staff of nearly three hundred.

We are still a "small" organization to the extent that each product manufactured is a personal matter with us . . . to be sure it gives the service claimed for it.

When war made it necessary for industry to lay aside private business, our modern machines and skilled personnel accumulated through increased private business immediately were able to take on their new job.

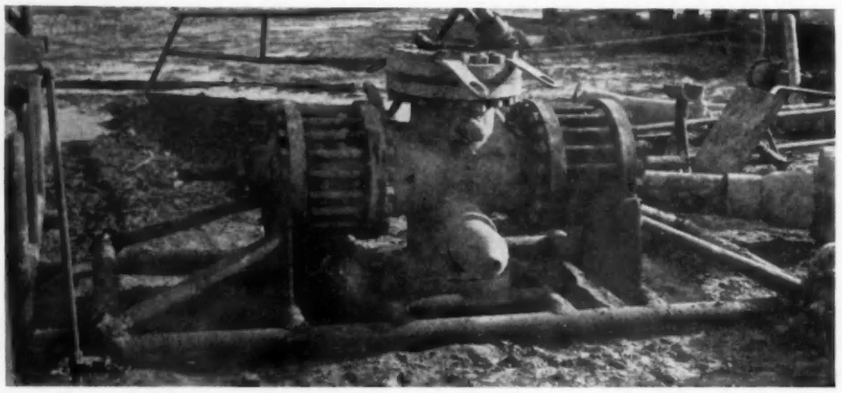
That's where our story ends today. We are doing war work first. From here on not only our story, but the story of our country depends on Industry and men doing their best with the implements and advantages Free America has given them.

HUNT TOOL COMPANY

PRACTICAL OPERATING *Hints* FOR

1. *EQUIPMENT CARE*

Specialized Support Transfers B.O.P. Unit



Extra care spent in fitting this skid to the specialized unit provides extra protection on rig shifts and insures arrival at new location in proper condition to offer full protection.

THE BLOW-OUT preventer being one of the costliest of the drilling well casing head fittings, one company uses a specially-built cradle to protect it from damage while it is being moved on and off the well, and while in the storage yard.

Built of salvaged 3- and 2-inch tubing and a small amount of steel plate, the all-welded base has turned-up ends to facilitate skidding. The heavy fitting rests in the normal upright position in the center of the base, and the outer flanges of the two cylinders rest upon half-circle cradles welded atop steel plate uprights. Near the outer edge of each of these cradles is a low steel strip welded to the circular rest which prevents the heavy fitting from sliding laterally when the weight of the unit is shifted to either end while loading on an incline. For added strength, short 2-inch pipes are welded between the vertical uprights and the turned-up ends of the skid base.

The extra care going into this skid pays returns over the long life of the unit by insuring maximum safeguard against blowouts.

2. *RIGGING UP*

Separable Mud Flume Speeds Rig Hauling

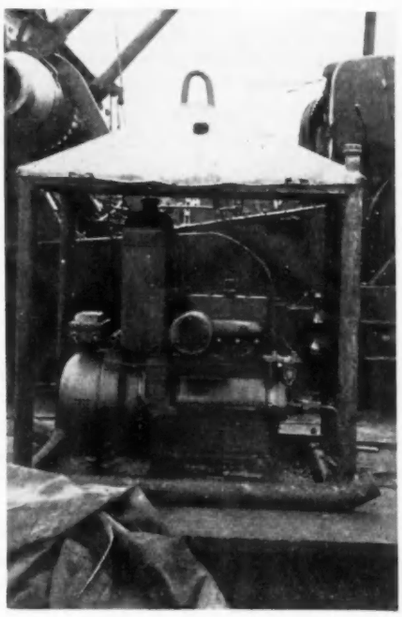
CERTAIN advantages may be gained by setting up the shale shaker some 30 or 40 feet away from the derrick floor, instead of following the commonly accepted, short-coupled arrangement used by the majority of operators. Chief among these advantages is having a broad clearing around all but the rack side of the rig, so that trucks can maneuver without difficulty when heavy or cumbersome equipment must be moved or unloaded at the well.

In the case of the set-up shown it is necessary only to remove the two casing sections of mud ditch which span the roadway, in order to allow a truck to approach that side of the derrick.

Such an arrangement has its advantages in the event of a well blow-out or other emergency, when it is essential that a maximum amount of room be available around the well head.

3. *AUXILIARIES*

Lighting Unit Frame Serves as Gas Tank



By cutting openings within weld areas on pipe frame, capacity is provided for ample fuel supply.

TO PROVIDE fuel for the small gasoline engine driving the rig lighting set, ingenious use was made of the pipe forming the skid and integrally welded lifting frame.

Instead of making the various welds of the frame simply those of a formed

THE practical operating hints for the drilling rig, production man and pipeliner, appearing regularly in these pages, are secured from oil operations everywhere and offer suggestions that will help to improve operating efficiency and safety.

The items give an excellent picture of the remarkable ingenuity being exercised by the operating divisions of the industry. Contributions to these features will be paid for at the rate of $5 for each illustrated item accepted. Address contributions to "The Editor, The Oil Weekly, Houston."

By setting mud shaker far enough from derrick foundation to afford roadway between, removal of portable sections in mud flume permits ready truck access all around structure.

THE DRILLING RIG . . .

pipe end over the surface of the adjoining member, holes were cut through the pipe walls at points to be welded, so that the entire frame was provided with communication channels, and all joints were made up so as to be leak-proof.

One corner member was extended up through the penthouse roof, to serve as filler spout, and a ¼-inch collar welded to the base to carry the suction to the fuel pump.

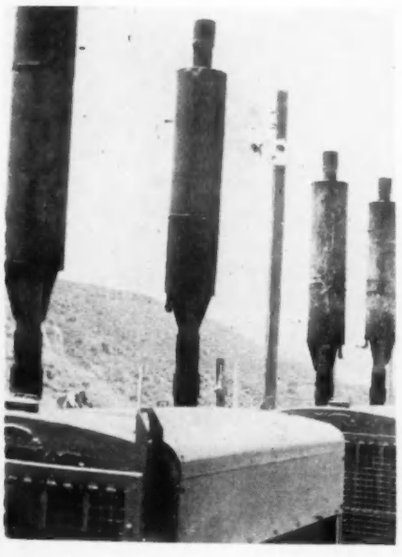
The combined capacity of the various pipes forming the frame is several times that of the usual thin-walled tank, and is much less likely to suffer damage or spring a leak either in operation or being transferred between locations.

4. *FIRE PROTECTION*

Jacketed Mufflers Snub Exhaust Hazard

TO REDUCE the hazard of fire at drilling operations when gas or diesel engines are used for rig power, one company running several strings of tools equips its mufflers with water jackets and connections thereto for the attaching of water hose or other supply source.

In regular drilling operations the mufflers are run dry, but as soon as the bit nears the producing zone or intermediate gas-producing formations, water is run into the mufflers and their temperature so reduced as to cool the exhaust gases below the ignition piont of any oil spray or gas mixture which may exist around the rig.



Circulating water through and around hot gases effectively cools exhaust and quenches occasional spark.

5. *MUD CONDITIONING*

Heated Mixers for Mechanical Rig Use

Gas-fired tanks on skid replace steam-heated units for treatment of additives to meet operating demands.

IF IT IS FOUND or recommended that the chemicals being added to mud give better results when mixed hot, a convenient type of heater can be devised and built for use at mechanically powered rigs where no steam is available for heating the solution.

Tanks of a handy size are mounted on a unitized base, and welded integrally so as to provide strength against rough handling on the move.

A false bottom is welded in each tank, far enough above the actual base to provide space for burners and adequate air circulation to support necessary combustion. Burner leads are tapped into the pipe forming the skid base, this frame being utilized as volume chamber and reservoir for the fuel being fed the burners. Doors are fitted for control of air to the burners, and for replacement or adjustment of the units themselves. The stack for burned gases is carried through the false bottom and to a point above the rim of the tank.

Supply lines permit water to be added to the tanks, other lines, valve-controlled, permitting the heated solution to be drawn off and pumped into mud pits or direct into mud stream in the flume.

Where not required for heating mud admixtures one or both of the tanks may serve in place of the steam rig's "blow-box" for washing crews' work clothes, or as source of hot water for other purposes around the rig.

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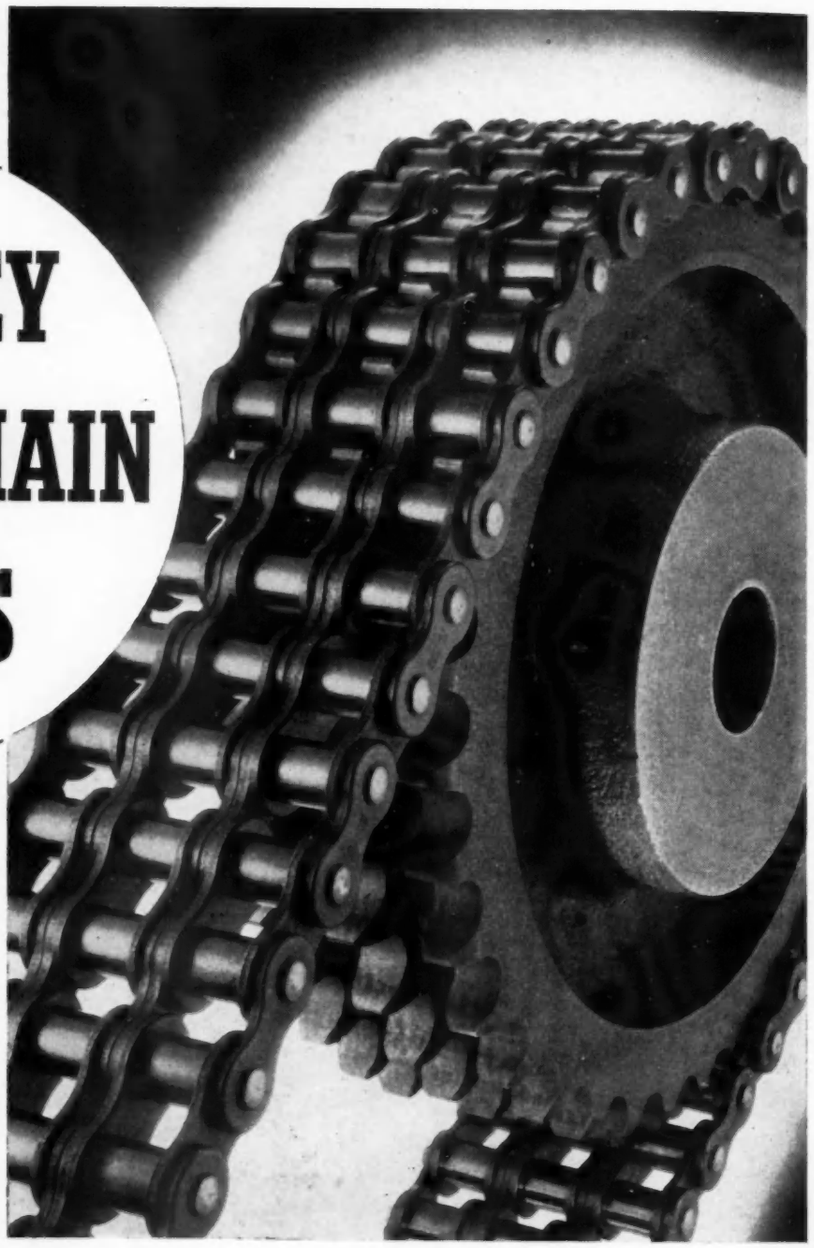

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The Week's News

Southwest Is Facing Big Increase in Oil Demand

Despite curtailment of civilian gasoline use through rationing, the oil industry faces prospects of being called upon to increase its production substantially because of the stimulating influence of te war effort on consumption of other products. This belief, together with an expression that there was a growing hope for higher crude prices, was the encouraging keynote of several addresses given before the annual meeting of the Texas Mid-Continent Oil & Gas Association meeting at Dallas last week. Such encouragement however, was sobering by the revelation that there are increasing indications that difficulty may be experienced in filling the growing demand for petroleum products, that it appears more wildcat drilling must be done, that the steel supply situation remains exceptionally acute, and that additional costly adjustment of refinery yields is necessary.

All officers of the association were re-elected. George Sawtelle, president of Kirby Petroleum Company, Houston, was re-elected president. George C. Gibbons, Dallas, was selected to be executive vice president a second time while Eugene McElvaney of Dallas was renamed treasurer.

The vice presidents re-elected include J. Cooke Wilson, B. G. Byars, J. L. Collins, Charles J. Tucker, B. L. LaFevere, A. E. Mermann, W. J. Rhodes and Al Buchanan.

The thought that other sources of demand would be so stimulated by the war effort as to largely compensate for the losses in civilian consumption that would result from gasoline rationing came from D. E. Buchanan, director of OPC District 3, and other speakers.

"The facts indicate that voluntary curtailment of passenger-car operation in the Midwest and Pacific Coast states has reached a level closely approaching the desirable level," Buchanan asserted. To this thought he added the view that over 32 percent of the motor gasoline manufactured in Texas-Louisiana-New Mexico-Arkansas moves to the Atlantic seaboard, which has been rationed for several months. Naturally, this should materially lessen the influence of rationing on the over-all consumption of gasoline.

Faced with an increasing military demand, the forthcoming reductions in civilian consumption, are likely to be "offset in large," Buchanan concluded. This over-all increase in demand for petroleum products must be furnished mostly from OPC District 3, and "it is not unreasonable at this time to expect the production rate of this area to exceed its present position in the total national supply," he said. "At the beginning of this war, this district was furnished 54 percent of the total demand, and during the lowest ebb of transportation, was still supplying 46 percent of the market. The demand for crude and products is geared to the transportation facilities available for movement outside the district, and the record shows that these facilities are being increased each month since the low was reached during May. "During the past several weeks," the speaker continued, "movement or demand, which because of limited transportation become synonymous, has reached a level close to the demand for the first two months of this year. The maximum rate of transportation has not yet been reached as tank cars, barges and pipe lines are being utilized with more and more efficiency.

"Projects that are now under construction or being converted will call for even greater demand on District 3 reserves. Other OPC districts find it most difficult at present to physically meet requirements due to lack of capacity or inability to produce additional oil. This means that a greater burden will be placed on District 3, which does have the increased production.

The industry faces a real responsibility in supplying the demand that lies before it, declared D. R. Knowlton, director of production for OPC, who emphasized that we are not finding as much oil as we are consuming and that therefore, despite our large reserves, we are fast dissipating them.

In 1934, Knowlton said, the average new discovery represented 20 million barrels of oil, while in 1941, the average new field contained but 1.2 million barrels. Today, there are only two areas which can be called upon for substantially increased sustained output. Knowlton named these as the Texas Gulf Coast and West Texas-New Mexico regions.

To correct this situation, Knowlton said there is need for a material increase in exploratory work and a substantial amount of field drilling. However, because the "steel situation remains downright acute," he held little encouragement for any material easing of the industry's equipment problem.

Knowlton warned oil men that they might have to do a lot of additional harsh things, and in this connection mentioned the surveys being made to inventory existing equipment and to determine the possibility of reclaiming equipment from shutdown and uneconomical wells. "OPC cannot ask for steel," he said, "when an excess quantity exists in some spots. The valleys must be leveled out."

He held out little encouragement for additional quotas of steel, and turned to the possibility of reclaiming material from uneconomic wells. "If the industry can not get material elsewhere, it must dig down and get it in order to fulfill its war obligations. If industry does not do this itself, it probably will be forced to do it anyway, Knowlton warned.

Dr. Robert E. Wilson, chairman of the economic committee of the Petroleum Industry War Council, was another who pointed out the necessity for higher prices. Wilson, who confined most of this talk to the East Coast transportation difficulties, said that refinery yields need to be adjusted materially to (1) meet the increased demand for fuels and (2) cut gasoline output to lower requirements occasioned by rationing. Unless this is done, we will have a daily surplus of 200,000 barrels of gasoline, and be short 50,000 barrels of distillate oils and 100,000 barrels of residual fuels, he asserted. For refiners to make such drastic adjustments of

News Index

Washington 9
Markets-Statistics 46
Men in the News 61
United States Field Operations:
Arkansas 58
California 59
East Texas 56
Eastern States 60
Illinois 49
Indiana 49
Kansas 50
Louisiana 57
Michigan 60
Mississippi 58
New Mexico 52
North Texas 54
New Mexico 52
Ohio 60
Oklahoma 50
Pennsylvania 60
Southwest Texas 56
Texas Gulf Coast 57
Texas Panhandle 54
West Texas 52
West Central Texas 54
West Virginia 60

Texas Hearing Again to Consider Allocation Change

The Texas Railroad Commission has scheduled its next state-wide hearing for October 19. The hearing is to be divided into a morning and afternoon session.

At the morning session evidence will be taken upon which allowables for November will be based. At the afternoon session, however, the commission will take up the proposal to change the method of allocations to meet war conditions. Primarily, the commission will consider any proposal that will aid in conserving manpower or materials, or reduce waste in Texas oil fields. Thus the operators will be invited to present plans for handling pumping wells where equipment is not available, with the view to transferring the allowables for these wells to others on the same lease. They may present plans for staggering producing operations in order to utilize the fewest man-hours of labor, or programs to close in wells producing with high gas- or water-oil ratios, as a means of preventing wasteful operations.

It is expected that considerable attention will be directed to the East Texas field where several programs are under consideration for reducing water production. The commission has been told that if 1000 oil wells were closed in the field, total oil production could be increased materially without a pressure decline. The 1000 wells in question are those that produce large volumes of water along with the oil.

yields, price adjustments are necessary, Wilson concluded. The industry now is operating on a basis of 5 cents less return per barrel of crude, and should go to a scale that would be returning 11 cents less per barrel. The major difficulty with petroleum-product price ceilings, he continued, is that they were established when gasoline was the principal product. This is no longer true, and adjustments are badly needed, but OPA is very reluctant to advance fuel oil prices because of its widespread influence on the entire price ceiling schedule. Therefore, Dr. Wilson suggested that refiners be paid for increasing fuel yields, the payments being based on the volume of increase.

Association Honors Cullen and Pew

H. R. CULLEN

JOHN G. PEW

H. R. Cullen, Houston, and John G. Pew, Dallas, were presented Distinguished Service Awards by the Texas Mid-Continent Oil and Gas Association in annual meeting at Dallas, October 9. Both oil men were given the awards for their achievements in the oil industry and for their contribution to the industry's progress.

Cullen was born on a ranch in Denton County, Texas, July 3, 1881. He began work at 12 in a candy factory at San Antonio for $3 per week. At 16 he went to work for a cotton merchant at $6 per week and continued in that business until 1911 when he moved to Houston.

He entered the oil business in 1917. His first two attempts were failures. He found his first production at Pierce Junction, where he developed a deep sand. This success was followed by a minor strike at Damon's Mound. In 1926 he started new development at Pierce Junction when he discovered a new producing horizon at a deep level on the flank of the dome.

Shortly afterward Cullen and J. M. West organized Cullen & West with a capitalization of $1,000,000. The company's most important discovery was Thompson (Rabb's Ridge) in Fort Bend County which was sold for $20,000,000 and an overriding royalty. Previous to the Thompson discovery, the company's first venture was at Blue Ridge, Fort Bend County, where 816,924 barrels were produced from a 7½ acre lease.

Cullen later formed Quintana Petroleum Company which has extensive holdings in Southwest Texas. The company last year opened first commercial oil production in LaSalle County with the discovery of Wilcox production on Washburn Ranch.

Cullen was honored for his achievements in Southwest Texas, March 21, 1941, at San Antonio when the South Texas Chamber of Commerce selected him as special guest and presented to him a special plaque. In 1939, he and Mrs. Cullen gave to the University of Houston the Roy Gustav Cullen Memorial building in honor of their son. He is a leader in Houston civic affairs.

Pew was born May 14, 1902, at Beaumont, Texas. He attended public schools at Dallas at Tulsa, Oklahoma, and later was a student at Southern Methodist University, Cornell University, and Massachusetts Institute of Technology.

He started in the oil business as a field clerk for Sun Oil Company at Richland and Wortham, Texas, in 1924. He became a scout and landman in 1925 and served at Lockhart, Texas, and Lake Charles, Louisiana.

In 1925 he was appointed crude oil purchaser for Sun Oil Company with headquarters at Dallas and was named assistant to the vice president in 1935.

Dr. Wilson also held the view that military demands are forthcoming and that they will play a big part in the industry's future operations.

With the nation's entrance in the war the association expanded its activity, and has taken a leading role in black-out and protective work against the enemy, and also in the scrap drive. In addition it has been active in the fight against elimination of the industry's depletion rights. These were emphasized by the association president, George Sawtelle, in his annual report.

"In order to protect oil companies against impractical and expensive defense orders, and at the same time cooperate fully," stated Sawtelle, "the facilities of the association were offered the Office of Civilian Defense and later to military authorities who accepted the services." As result, studies were made of the possible elimination of gas flares, and the industry's own telephone facilities have been arranged to be used to quick notification of enemy attacks. The military has frequently expressed its appreciation of this work by the association.

"Texas oil was the first large industry to move in a concerted manner to collect its scrap, and reportedly kept many steel mills running," Sawtelle declared in pointing out that over 5000 carloads of scrap were shipped from Texas oil centers up to June 1. "The outstanding results of our scrap drive attracted the attention of WPB and the pattern of our organization," he continued, "was used nationally to organize other states. At the request of WPB, George Gibbons, executive secretary of the association, devoted his full time in helping with the national organization of industries."

To fight the effort to have depletion and intangible drilling costs eliminated from tax provisions, the association has had 21 active committees of 25 men in each congressional district in Texas at work.

Military Deferments

Lt. Col. D. B. Burns, U. S. Selective Service, gave a preview of the long-range operation of selective service, which he said was charged with two fundamental responsibilities: (1) the selection of men for the armed forces; and (2) the selection of men to be retained in essential industries.

Because oil is actively supporting war production, it has been classified as an essential industry by Selective Service. However, Colonel Burns asserted, "Don't assume that all occupations within the industry are critical occupations." There has been established a list of critical occupations in the petroleum industry [THE OIL WEEKLY, October 5, 1942], but "even though an employe comes with the purview of this bulletin," he continued, "is not conclusive within itself that he qualifies for occupational deferment. Your test in this respect is:

"(1) He cannot be replaced because of a shortage of persons with his qualifications or skill in such activity; and (2) his removal would cause a serious loss of effectiveness in such activity.

"If all these conditions can be met then you are justified in asking for occupational deferment of such employe."

Deferment, however, Colonel Burns declared, "is a temporary convenience to provide six months in which to train someone else to take the deferred employe's place or seek a replacement."

Gas Association Speakers Look Beyond War Period

The nation's natural gas requirements after the war will make still more acute the problem of balancing supply and demand geographically, according to J. French Robinson, president of East Ohio Gas Company, Cleveland, one of the principal speakers at the twenty-fourth annual meeting of the American Gas Association in the LaSalle Hotel, Chicago, last Monday and Tuesday.

"The machinery for this, luckily, already exists and will have been improved and perfected in the ease and speed with which it functions," Robinson said. "It is obvious also, that the successful integration of our industry with other industries affecting the mutual exchange of critical materials needed, will also be retained as a profitable lesson taught by this war."

He asserted the potential values of natural gas will be realized after the war as never before and that there will be a better balance of utilization itself, "by which I mean the greater social usefulness of natural gas by an increased scientific study of the appliance in which natural gas is used and the purpose for which it is used."

Season balances nationally by districts and by companies in the post-war period will be sought by new methods, he continued, in the increased use and development of present methods.

Robinson asserted that in the Appalachian area and some other districts, the discrepancy between demand and supply at present is reduced to a minimum by all means now known.

Chief method for countering a peak-day shortage is off-peak storage of gas, both underground by repressuring pools and by storage of liquefied natural gas in above-ground containers, Robinson pointed out.

After the war the advantages of natural gas as a fuel will not be calculated in terms of present or past localities of utilization, he said.

"It is true that the requirements of those communities which have been built up around natural gas as a fuel will continue to increase and be met by an improved system of national distribution patterned after the present coordination plan. But it is also probable enough to demand inclusion in any post-war consideration, that the advantages of natural gas will be extended to new communities, new markets, new forms of utilization. House-heating with gas had only begun to strike its stride when this war befell us. Our people will never give up this priceless advancement in living."

Because the war will make terrific inroads on the nation's resources it will be necessary to carefully husband what is left, Robinson asserted.

"Intensification of all research and engineering and educational effort for conservation all along the line must be included in any consideration of post-war requirements and supply," he said. "The three are inseparable. By conservation I mean economical and wise use of natural gas, and this again heads up into a system of centralized authority and coordinated industrial efforts. Indeed, without intensive conservation effort on the part of all of us, the time will soon come when there will not be any natural gas industry, not even for war."

Robinson called attention to the fact that the country and the people which will be supplied with natural gas after the war, "will be the country and the people to emerge from the war—what happens to the country and people in it during the war, will determine both the supply of natural gas and the manner of its use."

He predicted that competition between natural gas and other fuels, the like of which the industry never has seen, will follow the war.

In his presidential address, George S. Hawley, Bridgeport, Connecticut, president of Bridgeport Gas Light Company, used a Bible text to illustrate the industry's plight.

"We are troubled on every side," he quoted, "yet not distressed; we are perplexed, but not in despair. Persecuted, but not forsaken; cast down, but not destroyed."

Hawley emphasized the need for research which will result in better utilization of gas and disposition of combustion products and make possible the building of new appliances for domestic use.

Another speaker was E. Holley Poe, Director of the Natural Gas Natural-Gasoline Division of OPC, who asserted that the natural gas business, as never before, is one of supply and demand. He indicated that the nation has ample gas reserves, strategically located to meet demands. However, he also emphasized that conservation of this resource is absolutely essential.

Poe declared it will continue to be the policy of OPC to recommend changes in M-68 whenever the demands for critical materials or oil and gas dictate such changes.

Explanation of research at the Institute of Gas Technology of Chicago was made by F. W. Sullivan, Jr., technical director of the institution. Principal research activities of the institute, according to Sullivan, have centered in the preparation of butadiene, the chief raw material of synthetic rubber.

The association named as its new president Arthur F. Bride, vice president and general manager of Southern Counties Gas Company, Los Angeles. Other officers include Ernest R. Acker, president of the Central Hudson Gas & Electric Corporation, Poughkeepsie, New York, vice president, and J. L. Llewellyn, insurance manager of Brooklyn Union Gas Company, Brooklyn, New York, treasurer.

Directors include:

John W. Batten, vice president and general manager, Michigan Consolidated Gas Company, Detroit.

James A. Brown, engineer in charge of gas operations, Commonwealth & Southern Corporation, New York.

D. W. Harris, vice president and general manager, Arkansas-Louisiana Gas Company, Shreveport.

H. N. Mallon, president, Dresser Manufacturing Company, Bradford, Pennsylvania.

Hudson W. Reed, executive vice president, The Philadelphia Gas Works Company, Philadelphia.

W. F. Rockwell, president, Pittsburgh Equitable Meter Company, Pittsburgh.

Herman Russell, president, Rochester Gas & Electric Corporation, Rochester, New York.

Marcy L. Sperry, president, Washington Gas Light Company, Washington, D. C.

T. J. Strickler, vice president and general manager, Kansas City Gas Company, Kansas City.

P. S. Young, chairman, executive committee, Public Service Electric & Gas Company, Newark, New Jersey.

R. G. Barnett, vice president and general manager, Portland Gas & Coke Company, Portland, Oregon.

Accounting Section—Chairman, L. A. Mayo, Connecticut Light & Power Company, Hartford, Connecticut. Vice chairman, O. H. Ritenour, Washington Gas Light Company, Washington, D. C.

Industrial and Commercial Gas Section—Chairman, B. H. Gardner, Columbia Gas & Electric Corporation, Columbus, Ohio. Vice chairman, Charles G. Young, Springfield Gas Light Company, Springfield, Mass.

Manufacturers' Section — Chairman, John A. Robertshaw, Robertshaw Thermostat Company, Youngwood, Pennsylvania.

Natural Gas Section—Chairman, Burt R. Bay, Northern Natural Gas Company, Omaha, Nebraska. Vice chairman, R. E. Wertz, Amarillo Gas Company, Amarillo, Texas.

Residential Section—Chairman, B. A. Seiple, Jersey Central Power & Light Company, Asbury Park. Vice chairman, C. V. Sorenson, Midland Utilities Company, Hammond, Indiana.

Technical Section—Chairman, Harold L. Gaidry, New Orleans Public Service Inc., New Orleans. Vice chairman, Charles F. Turner, East Ohio Gas Company, Cleveland.

Gas Companies Win Million Man-Hour Awards

One division of Oklahoma Natural Gas Company, Tulsa, and five divisions of Ohio Fuel Gas Company, Columbus, received merit awards from the association. The awards were presented for achievements in accumulating one million or more man-hours without a disabling injury accident. The awards, which were recommended by the accident prevention committee and approved by the executive board, were presented by President George S. Hawley at the association's general luncheon on October 6.

The award to Oklahoma Natural Gas Company was made to the Oklahoma District of that company. The awards to Ohio Fuel Gas Company were presented to the Elyria, Toledo, Northern Compressor Division, Columbus; Distribution Department, District No. 5, Mansfield, and the Southern Compressor Division, Columbus.

Petroleum Electric Group Cancels Annual Convention

The Petroleum Electric Power Association will not hold its annual conference this year, the board of directors decided at a meeting in Dallas, October 2.

The annual conference usually is held in December, but due to the desirability of keeping travel to a minimum, and also due to the fact that both the petroleum industry, electric manufacturers and the electric utility industry have about all they can do to meet the demands incident to the war program, it was decided to forego the annual convention.

The directors anounced there will be a one-day streamlined conference of the member-company representatives at the Baker Hotel in Dallas, November 12. This meeting is for the purpose of transacting association business and election of officers. The meeting will be for business only and will be for the purpose of making a greater contribution to winning the war, the directors said.

Markets • Statistics • Prices

Heavy Demand Brings Increased Refinery Output

Heavy demand for heating oils along with an increase of refinery throughput east of the Rocky Mountains was evident in the trend of markets last week.

For the nation refinery runs were up 77,000 barrels daily over the previous week. The combined area of the East Coast, the Texas and Louisiana Gulf Coast, North Louisiana, Arkansas and Inland Texas, the increase was 126,000 barrels daily. All areas were up with the exception of the Appalachian region and California, where runs were down 47,000 barrels daily.

Production of gasoline showed a corresponding increase of 627,000 barrels for the nation. Only the Appalachian area showed a drop of motor-fuel stocks.

Gasoline stocks, however, were down from the previous week, 189,000 barrels. The Oklahoma-Kansas district showed a marked decrease, 258,000 barrels, while the Indiana-Illinois group registered an increase of 106,000 barrels.

Burning oil stocks in which the demand is heavy because of the approaching heating season, registered favorable gains. Increases were in areas removed from those of high demand, leaving shipping as the answer to providing fuels. Furnace distillate and gas oil stocks increased by 491,000 barrels with the East Coast, Texas, Louisiana and Arkansas combination responsible for accumulation of 622,000 barrels. In the Indiana-Illinois-Kentucky area reserves of these oils were reduced by 252,000 barrels.

Heavy fuel oil recorded only a slight stock increase, 93,000 barrels. Since California showed an increase of 86,000 barrels, the stock situation on heavy fuel for the remainder of the nation, was but little changed from last week.

Expanding use of tank cars for transporting crude oil to the East Coast has kept the movement of finished materials out of inland refining centers a few days late.

Despite the assurance that rationing of motor fuel will become national in scope, refiners in all areas report little change in demand for gasoline.

Crude-oil production for the nation continued to decline according to statistics from the American Petroleum Institute. For the week ending October 3, average daily output was 3,648,500 barrels, a decline of 224,550 barrels daily from the average of the previous week. Texas accounted for 173,150 barrels of this total as this state showed increases in only two of its major areas and their total was only 1100 barrels. Daily output was down 34,300 barrels in California.

Line Completed

Magnolia Petroleum Company has completed a 2½-mile combination 4-inch oil line from its recent Glenn pool discovery in southern Crane County, West Texas, to its Abell field gathering system and tank farm. The Abell field tankage is emptied periodically by The Texas New Mexico Pipe Line Company for the account of The Texas Company, which exchanges an equal volume of Slaughter field oil with Magnolia.

Gasoline Line Begins Operating

Phillips Petroleum Company has placed in operation a natural gasoline pipe line that will deliver the output of its controlled and affiliated plants in Lea County, New Mexico, and West Texas to the company's Panhandle refinery at Borger. The filling of this line with gasoline began September 25. The line consists of 240 miles of 8-inch from Borger to New Mexico terminal near Hobbs, with a 60-mile 6-inch extension from a point in Gaines County, Texas, thence southeast to the Goldsmith field, Ector County.

Propose Carbon Black Plant In Oklahoma

Cabot Carbon Company has requested of Oklahoma Corporation Commission permission to construct a 7,000,000 cubic feet carbon black plant in Texas County, Oklahoma panhandle.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

ITEM	Crude Oil Prod.		Runs to Stills		Crude Stocks		Gasoline Stocks		Gas Oil & Distillate Stocks		Residual Fuel Oil Stocks	
	Bbls. Day (Add 000)	Week Ended	Bbls. Day (Add 000)	Week Ended	Bbls. (Add 000)	Week Ended	Bbls. (Add 000)	Week Ended	Bbls. (Add 000)	Week Ended	Bbls. (Add 000)	Week Ended
Highs:												
1939	3,910	8- 5	3,650	10-21	278,607	5-26	87,769	4-22	39,562	10-28	116,237	8-26
1940	3,890	3-16	3,690	6-22	265,865	8-31	102,817	4-20	49,051	10-19	109,135	9-14
1941	4,337	11-22	[4]4,120	10-18	266,187	3-29	99,727	3-29	[4]54,983	11-15	102,448	1- 4
1942	[4]4,337	2- 7	3,961	1- 3	263,208	3-28	[1]107,229	3-14	49,357	1- 3	95,857	1- 3
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-21	71,152	10- 7	20,722	4-15	105,397	4- 8
1940	3,335	11-30	3,370	1- 6	237,339	1-27	79,847	11- 9	23,551	4- 6	102,344	2-10
1941	3,364	1-11	3,490	1-18	240,399	11-15	80,870	10- 4	28,381	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	242,785	9-26	80,356	9- 5	29,240	4-25	76,903	7- 4
Trends in 1942 (Week Ended):												
Jan. 3	4,038	.....	3,961	.....	244,440	.....	92,987	.....	49,357	.....	95,857	.....
Jan. 31	3,871	.....	3,848	.....	250,740	.....	97,810	.....	40,674	.....	91,189	.....
Feb. 28	4,016	.....	3,675	.....	259,373	.....	105,635	.....	34,547	.....	88,285	.....
Mar. 28	3,820	.....	3,667	.....	263,208	.....	105,624	.....	31,756	.....	83,045	.....
April 25	3,581	.....	3,506	.....	257,073	.....	102,897	.....	29,240	.....	81,107	.....
May 30	3,877	.....	3,522	.....	255,023	.....	95,355	.....	31,384	.....	79,628	.....
June 27	3,719	.....	3,581	.....	253,364	.....	88,396	.....	32,851	.....	77,304	.....
July 25	3,691	.....	3,658	.....	249,262	.....	82,281	.....	35,966	.....	77,816	.....
August 29	3,964	.....	3,697	.....	249,007	.....	80,831	.....	42,060	.....	78,034	.....
September 5	3,683	.....	3,656	.....	246,942	.....	80,356	.....	42,819	.....	78,267	.....
September 12	3,902	.....	3,710	.....	244,671	.....	81,758	.....	43,567	.....	78,633	.....
September 19	3,936	.....	3,713	.....	244,294	.....	80,882	.....	44,442	.....	79,335	.....
September 26	3,909	.....	3,802	.....	242,785	.....	80,550	.....	45,945	.....	78,943	.....
Oct. 3, 1942	3,685	.....	3,879	.....		.....	80,361	.....	45,750	.....	79,036	.....
Oct. 4, 1941	3,861	.....	4,052	.....	[4]246,649	.....	79,923	.....	51,420	.....	94,978	.....
Change:												
In week	—224	.....	+77	.....	—1,509	.....	—189	.....	—195	.....	+93	.....
In year	—176	.....	—173	.....	—3,864	.....	+438	.....	—5,670	.....	—15,942	.....
In year	—4.5%	.....	—4.2%	.....	—1.5%	.....	+0.5%	.....	—11.0%	.....	—16.7%	.....

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks, September 27, 1941.

Petroleum Production in the United States

(Estimates compiled by The Oil Weekly. All figures indicate daily averages, in barrels)

STATE OR DISTRICT	[1]OPC Allocation in October	PRODUCTION IN WEEK ENDED Oct. 3	Oct. 10
Arkansas	79,500	73,050	73,850
California	782,000	700,600	732,900
Long Beach	.....	34,800	35,300
Midway-Sunset	.....	57,100	56,500
Kettleman Hills	.....	38,700	38,900
Wilmington	.....	94,600	97,700
Rest of State	.....	475,400	504,500
Colorado	7,000	6,775	6,825
Illinois	280,000	264,600	270,450
Salem	.....	39,450	38,900
Louden	.....	47,550	44,700
Other New Pools	.....	165,550	168,550
Old Pools	.....	12,050	18,300
Indiana	19,000	16,750	17,350
Kansas	294,000	282,700	276,300
Kentucky	13,800	12,100	12,250
Louisiana	337,200	325,850	326,550
North	.....	98,400	98,650
South	.....	227,450	227,900
Michigan	65,700	62,950	62,300
Mississippi	50,000	71,400	69,850
Missouri	.....	130	130
Montana	24,400	23,150	23,650
Nebraska	3,500	3,300	3,250
New Mexico	101,100	97,200	98,600
New York	15,400	13,350	13,550
Ohio	11,400	9,500	9,650
Oklahoma	417,000	368,550	365,850
Oklahoma City	.....	69,650	70,750
Seminole Area	.....	86,900	87,850
Rest of State	.....	212,000	207,250
Pennsylvania	50,800	50,500	53,150
Tennessee	.....	30	30
Texas	[2]1,407,600	1,207,550	1,350,800
Upper Gulf Coast	.....	281,950	304,250
East Texas Field	.....	293,250	361,850
Rest of Eastern Texas	.....	81,850	90,600
Lower Gulf Coast	.....	84,950	94,750
Southwest Texas	.....	41,250	49,200
South Central Texas	.....	16,950	17,950
West Texas	.....	183,300	206,450
North Texas	.....	139,200	140,300
Panhandle	.....	84,850	85,450
Utah	.....	15	15
West Virginia	16,000	10,050	10,350
Wyoming	90,800	97,200	98,850
Total United States	4,066,200	3,697,300	3,876,500

[1] Production rates recommended for states by Office of Petroleum Coordinator, on basis of Bureau of Mines forecast of the nation's daily average requirements for domestic crude during month. State conservation authorities except Texas Railroad Commission have prescribed allowables calculated to hold actual production within OPC regulations. (Details on state allowables published in The Oil Weekly of October 5, page 43.)

[2] In general, Texas fields will be shut down on October 3, 4, 10, 11, 17, 18, 24, 25 and 31, but the number varies in different fields.

PIWC

[*Continued from page 10*]

a better situation in the East than used by OPA as a basis for fuel-oil rationing, which contemplates reduction of consumption by one third.

"Cannot Run on Losses"

In its report, the committee warned that the industry cannot "run on losses" and made a plea for immediate and adequate action to compensate for the excess costs involved in wartime changes. To meet gasoline rationing and increased demand for other products, the refinery yield of gasoline will have to be dropped to an average of 35 percent from last year's average of 45 percent, while the yield of kerosine will have to be increased from 20 to 23 percent and that of residual from 21.7 to 27 percent.

Extension of gasoline rationing to a nation-wide scale and other recent developments have made it necessary for the committee to revise its previous operating program, the committee revealed.

Two major developments of the past month were the failure to bring tank-car deliveries into District 1 to the level estimated as both necessary and attainable and the failure of products delivered to reach the desired proportions, it was stated.

While gasoline stocks have actually declined by only 100,000 barrels as against a forecast of 500,000 barrels in the September report, stocks of kerosine and distillate fuel oil have increased only 3,200,000 barrels as against a forecast of 4,800,000 barrels and those of residual fuel oil have increased only 900,000 barrels as against an estimate of 5,000,000 barrels.

Some improvement in deliveries is expected as a result of the new pooling program, the report said, but it was emphasized that the attainment of the deliveries which it estimates as possible are dependent on better rail movement and on continuance of some deliveries by tanker during the winter, "neither of which can be considered to be definitely assured."

Nation-wide rationing will necessitate further drastic changes in refinery yields so as not to exceed the gasoline outlet which will be available, it was emphasized. If these changes are not made and current yields are continued, the four districts east of the Pacific Coast would produce almost 200,000 barrels daily of excess gasoline with correspondingly reduced supplies of distillate and residual fuel oils, or crude runs would have to be reduced with a consequent shortage in distillate and residual fuel oils of more than 200,000 barrels daily.

A 90-day postponement of the inauguration of nation-wide gasoline rationing was urged in a resolution adopted by the council, to afford an opportunity to determine whether the 35-mile speed limit and voluntary cooperation will not achieve the same result.

"Current studies of gasoline consumption have convinced most of the oil industry that the nation-wide speed limit and already widespread voluntary rationing outside of the East Coast will accomplish all of the objectives of the Baruch committee report without the necessity of coupon rationing," Chairman William R. Boyd, Jr., explained.

"It is still too early to submit positive proof of this on a nation-wide basis, but a large number of spot checks at Mid-Western and other points outside the East Coast show that gasoline consumption already has been reduced to levels comparable with current consumption under rationing on the East Coast, which apparently satisfies all of the requirements of the Baruch report.

"The industry, therefore, through its war council, has recommended that the government withhold the inauguration of coupon rationing for a short period, to determine accurately, by government checks, whether the 35-mile speed limit and the voluntary cooperation of motorists cannot accomplish just as much as coupon rationing."

The council went deeply into the materials situation, adopting a resolution calling upon the coordinator to "insist" that WPB grant the minimum steel recommended for lubricant containers by the lubrication and containers subcommittee (41,157 tons for the current quarter), and that order L-197 be revised to make second-hand drums in the hands of the industry continuously available for the distribution of products for which they have been regularly used.

In resolutions dealing with production, the council attempted to forestall the freezing of drilling-contract prices, going on record that any regulation of such prices is unnecessary and will hamper rather than aid the prosecution of the war.

It pointed out that drilling-contract prices vary to such an extent over a small geographical area, due to differences in labor, transportation and material costs that uniformity is almost impossible. The resolution was adopted, it was explained, because OPA was seen as moving in the direction of freezing these prices.

In another resolution the council offered the industry's cooperation to the committees on materials and supplies that are being appointed in all the districts to study the reclamation of field equipment.

The council recommended action by OPC to iron out the situation created by its certifications of crudes from certain fields as being essential to the war effort because of certain properties, with the effect of causing the state regulatory bodies to increase the allowable of those fields and reduce the allowables of other fields in the same area producing crude of the same or approximately the same qualities.

It suggested, in a resolution, that before any special fields are so certified, the applicant for such certification be required to furnish an analysis of other crudes in the area, and if it is revealed that such other crudes have essentially the same properties and characteristics, and if transportation facilities are available, OPC include those fields in its certification so that the state authorities may allocate the demand between all fields meeting the qualifications.

A subcommittee on automotive transportation, to study the more efficient use of tank trucks and other transportation problems in connection with the possible pooling of facilities, was completed, with F. B. Hufnagel, Jr., of Sun Oil Company, Philadelphia, as chairman. Members of the subcommittee are J. A. Bruso, Continental Oil Company, Denver; E. M. Fitz, Shell Oil Company, San Francisco; Leo Huff, The Pure Oil Company, Chicago; Gavin Lawrie, The Atlantic Refining Company, Philadelphia, and Oscar Lynch, Humble Oil & Refining Company, Houston.

SURPLUS MATERIAL: Through the cooperation of the various district committees, an extensive list of surplus material and equipment now in the hands of refineries throughout the country which may be made available immediately for the erection of wartime plants has been compiled by OPC, it was disclosed by Max B. Miller, chief of the construction section of the refining division.

While a good deal of this equipment has seen prior use and some of it may not be suitable for the erection of modern plants, a great deal of it is in excellent condition and is of suitable design, Miller said. Some of the equipment is new, having been made available either through the cancellation of foreign projects previously scheduled or left over after the completion of projects in this country.

"This equipment and material is for the use of those engaged in erecting wartime plants," Miller explained. "It may be shipped immediately. It may be purchased direct from the owner.

"It is the function of this office to assist the prospective purchaser in securing the material. Because of the large number of items and for the reason that the list will be continually

added to and subtracted from, it has been considered impractical to publish a catalog listing the equipment and material. Also, it would seem impractical to attempt to match requirements through correspondence. In consequence, it is recommended that those erectors of war plants in petroleum refineries who may be interested in securing this material should have their engineers visit this office in order that they can inspect and select from the list of equipment that is then available. Already this procedure has been followed in a number of instances and has worked out satisfactorily."

CALIFORNIA: Amendment of Conservation Order M-68 to make materials available for the rehabilitation of wells in 84 California fields developed on patterns closer than the 40-acre spacing required by the order, was announced by the War Production Board October 8.

Acting on the recommendation of OPC, made after a study of the situation, WPB permitted operators in the fields, located in the Los Angeles Basin, San Joaquin Valley and the Santa Barbara-Ventura region, to deepen, plug back, recomplete and otherwise rework several hundred wells.

The purpose of the supplementary order is to encourage an increase in the production of heavy crudes yielding particularly high percentages of fuel oil.

Neither OPC nor WPB could give any definite estimate of the number of old wells which can be reworked, but it was said that many which have been idle for a long time can be placed in production again. A considerable number of California wells have been off production for many years because there was no great need for the type of oil they produced.

All of the fields covered by the order produce crudes yielding in excess of 50 percent finished fuel oil, in some the yield being more than 75 percent, it was said. Much of the oil is of gravity less than 24°, and practically all of it is recoverable from producing zones hundreds of feet thick, assuring a slow decline in productive capacity, with the top of the producing horizons of many fields only 500 or 600 feet below the surface.

The fields where rehabilitation of wells on spacing patterns closer than 40 acres will be divided into three categories. Five-acre spacing will be allowed in certain fields, and old wells may be equipped with pumping or other artificial lifting installations on an average density of 1 well to every 5 surface acres; in other fields wells may be reworked on a basis of an average density of 1 well to 10 surface acres, and the wells need not be uniformly located although the acreage attributable to them must be within the productive limits of the fields. The limiting depths of producing horizons to which wells may be deepened are specified for each field.

"It has been estimated that demand for fuel-oil-base California crudes will exceed 300,000 barrels daily before the end of 1942, and that it will probably increase considerably beyond that figure thereafter," Deputy Coordinator Davies said, in commenting on the order.

"California is our only source of petroleum supply west of the Rocky Mountains. The necessity for increasing the supply in a location so strategic from the standpoint of the war in the Pacific area is paramount.

"The quickest way in which this demand can be met without large expenditure of critical materials is through a program of reworking the many wells susceptible of rehabilitation. Accordingly, we have recommended, and the War Production Board has approved, certain exceptions as embodied in Supplementary Order M-68-3 that are intended to stimulate the production of crude oil at increased rates in those fields most capable of meeting war demands."

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U. S. Field Operations

Illinois Basin

Hamilton County Well Makes Good Producer

Magnolia gets good producer in Hamilton County pool; Gallatin County wildcat being tested; Gulf completes small producer in Jefferson County; Franklin County wildcat attracting interest.

Hamilton County: Magnolia's G. L. Travis 1, E½ NW SE 20-4s-7e, southwest outpost to the Blairsville pool five miles northwest of McLeansboro, pumped 378 bbls of oil and 56 bbls water from Aux Vases at 3272-3303 in 24 hours. The company's Travis 2, NE SE SE 20-4s-7e, was drilling below 2700 and Travis 31, NE SW SE 20-4s-7e, was below 1800.

Gallatin County: R. B. Martin's Straub 1, SE NW SW 15-8s-9e, 3 miles northeast of Ridgway, is testing Cypress at 2482-95.

South of the Roland pool Carter's Flora Graves 1, NW NE 21-7s-8e, was below 2870.

Jefferson County: Gulf's Lee Bradford 1, NW SE SW 14-1s-4e, 6 miles northwest of Wayne City, has been completed in McClosky lime at 2791-97 ft with an initial test of 22 bbls oil and 38 bbls water in 24 hours.

Wayne County: N. V. Duncan's Fannie Jones 1, SW NW NW 19-1s-7e, second test in the West Jeff area, is testing Aux Vases at 3130-56 ft. The well is a Pure Oil farmout and is near the village of Jeff.

Franklin County: Hutson and Jones Gilmour 1, SE SW NW 18-5s-2e, wildcat one mile east of Sesser, was drilling below 2600 feet. It is being closely watched by basin operators.

ILLINOIS FIELD COMPLETIONS

Clay County: Pure's Clark 14, c w½ se sw 8-2n-8e, Cyp 2648-61 ft, 12 bbls, 2662 ft.
Pure's Nadler 2, nw ne sw 4-5n-7e, Weller 2490-95 and 2510-26 ft, 16 bbls, 2534 ft.
Clinton County: Murphy & Goldsmith's Goldsmith 3, ne nw nw 2-2n-2w, Bethel 1217-30 ft, 110 bbls, 1230 ft.
Texas Co.'s Grey Comm. 8, ne se se 35-3n-2w, Bethel 1215-20 ft, 28 bbls, 1229 ft.
Texas Co.'s J. H. Schaefer A-1, sw se nw 35-3n-2w, Bethel 1217-24 ft, 61 bbls, 1224 ft.
Texas Co.'s Schaefer B-1, sw sw ne 35-3n-2w, abnd 1231 ft.
Hamilton County: Cameron Bros.' Hall-Biggerstaff 1, sw nw nw 5-6s-7e, abnd 3065 ft.
Gulf's Neal 1, nw ne nw 8-6s-7e, AV 3011-27 ft, 694 bbls, 3027 ft.
Shell's Morris 3, nw nw se 18-6s-7e, AV 3030-40 ft, 22 bbls, 3064 ft.
Texas Co.'s Cotter 1, c w½ ne nw 34-6s-6e, AV 3101-34 ft, 22 bbls 3138 ft.
Jasper County: A. H. Gibson's J. Steber 1, c e½ ne sw 7-5n-14w, abnd 2903 ft.
Kingwood Oil Co.'s Wilson 1, c e½ se sw 6-5n-10e, AV 2803-29 ft, 18 bbls, 2931 ft.
Lawrence County: Moindia Oil Co.'s A. Hershey 2, nw se se 27-2n-12w, Ben 1986-2021 ft, 20 bbls, 2021 ft.
Madison County: Shell's Frey 1, sw sw nw 15-3n-6w, Trenton 2393-96 & 2400-21 ft, 58 bbls, 2484 ft.
M. D. Bryant et al's Rhein 1, sw ne sw 16-3n-6w, Trenton 2352-73 ft, 115 bbls, 2373 ft.
Marion County: Markham Drlg. Co.'s Edwards Comm. 3, sw ne ne 17-1n-1e, abnd 1690 ft.
Wabash County: Kneipp & Bane's E. Wright 1, c e½ sw sw 9-1n-12w, abnd 1670 ft.
S. W. Mitchell's Bartolemy 1, c n½ sw ne 26-2n-12w, abnd 1421 ft.
Sam Malis et al's Smith 1, ne ne sw 27-2n-12w, Bethel 2055-63 ft, 33 bbls, 2063 ft.
Moindia Oil Co.'s Hershey 4, se nw se 27-2n-12w, abnd 2023 ft.
W. R. White's Hershey 1, ne nw ne 34-2n-12w, abnd 2051 ft.

Results on Industry's Prospecting Fronts

Completion of 57 wildcat operations during the week added 5 new oil producing spots. This brings to 303 oil producers discovered as result of 2417 wildcat operations this year.

Michigan: Arenac County wildcat has show of oil in Richfield.

California: Santa Barbara County wildcat will explore Vaqueros.

North Texas: Wise and Montague County tests have encouragement.

Oklahoma: New Hunton lime field in Okfuskee County.

East Texas: Two-mile extension recorded for Chapel Hill.

Wayne County: Pure's Atteberry A-1, sw ne se 11-1s-7e, AV 3078-97 ft, 361 bbls, 3140 ft.
Pure's Johnson A-2, sw ne sw 12-1s-7e, AV 3054-70 ft, 211 bbls, 3108 ft.
Deep Rock Oil Corp.'s Smith 1, 150 ft w of c s½ s½ 30-1s-7e, McC 3220-51 ft, 688 bbls, 3251 ft.
Sinclair-Wyoming's Henderson 1, c w½ nw sw 22-1s-6e, abnd 3259 ft.
White County: Sun's Bixenstine 3, c s½ nw se 7-4s-10e, Tar Spgs 2472-96 ft, 230 bbls, 2550 ft.

ILLINOIS WILDCAT COMPLETIONS

Fayette County—Failure: Paul Doran et al's Bush 1, se ne nw 28-6n-2e, abnd 2115 ft.
Franklin County—New Field: E. S. Adkins' Harrison A-1, se se ne 26-5s-1e, AV 2672-88 ft, 3 bbls 2857 ft.
Franklin County — Failure: Thompson & Vetsch's J. L. Davis 1, se ne se 32-6s-1e, abnd 2912 ft.
E. S. Adkins' Boner 1, se sw nw 31-7s-3e, abnd 2984 ft.
Hardin County—Failure: Todd et al's Porter 1, sw se sw 2-11s-9e, abnd 1822 ft.
Madison County—Failure: J. W. Menhall's Holtgrave 1, sw sw se 19-3n-6w, abnd 2379 ft.
St. Clair County — Failure: Weinert et al's North 1, sw sw ne 5-2n-6w, abnd 2471 ft.
Wabash County—New Field: Skiles et al's Wheatley 1, c e½ ne se 3-1s-13w, Bethel 2464-77 ft, 35 bbls, 2477 ft.
Washington County—Failure: T. M. Conray et al's Liebrock 1, sw sw nw 21-2s-3w, abnd 1475 ft.
Wayne County—Failure: Gulf's Melton 1, c s½ nw ne 1-1s-5e, abnd 3276 ft.

ILLINOIS WILDCAT STARTS

Franklin County: E. S. Adkins' Brown Estate 1, se ne nw 25-7s-2e, lcn.
Macoupin County: J. A. Hirsh et al's Benegueman 1, nw nw nw 17-8n-8w, lcn.
Montgomery County: W. R. Holmes' Sewing 1, nw se sw 28-8n-5w, lcn.
C. M. Stotts' Stotts-Richmond 1, nw sw sw 22-11n-5w, drlg.
Randolph County: Fred Erb's Young 1, se ne se 2-4s-5w, lcn.
Richland County: J. L. Black's Moseley 1, nw sw nw 15-3n-9e, lcn.
Wayne County: Bell Bros.' Allison 1, nw se sw 4-2s-9e, lcn.
White County: Pure-Carter's Austin A-1, nw sw nw 17-6s-9e, drlg.
Gulf's Harlen 1, se se se 15-7s-10e, lcn.

INDIANA FIELD COMPLETIONS

Gibson County: Russell Baldwin, Tr.'s Decker & Phillips 1, c se ne 23-1n-10w, abnd 1876 ft.
Continental's Maier 56, ne ne ne 1-3s-14w, abnd 2918 ft.
Continental's Thrash 3, 150 ft s of c w½ 18-3s-13w, Clore 1836-50 ft, 12 bbls, 2516 ft.
Posey County: Mahutska Oil Co.'s Holmans 1, nw ne nw 5-4s-13w, Cyp 2458-75 ft, 25 bbls, 2480 ft.
Carter's Lewis Hancock 1, c nw sw 9-7s-14w, abnd 2961 ft.
Carter and Gulf's Hellenberg 2, se sw nw 1-7s-14w, Walts 1996-2011 ft, 229 bbls, 2011 ft.
Warrick County: Kirk D. Holland's Bender 1, sw nw se 35-4s-6w, abnd 1300 ft.

INDIANA WILDCAT COMPLETIONS

Knox County—Failure: McBride, Inc.'s Brevoort A-1, 39-2n-11w, abnd 1880 ft.
Monroe County—Failure: Ky. Nat'l Gas Co.'s Dilley 1, c se sw 17-8n-3w, abnd 1270 ft.

INDIANA WILDCAT START

Gibson County: J. P. Babcock's Hargrove 1, ne nw nw 30-1s-9w, lcn.

U. S. Drilling Operations in Week Ended October 10, 1942

STATE	ALL WELLS COMPLETED THIS WEEK Total	Oil	Gas	Dry	*Miscel.	Total 1942	Total this Date 1941	‡WILDCATS COMPLETED THIS WEEK Total	Oil	Gas	Dry	Distillate	Total 1942
Alabama	....	....	....	....	....	3	2	....	....	....	....	....	3
Arizona	....	....	....	....	....	2	....	....	....	....	....	....	2
Arkansas	8	4	....	3	1	107	133	3	....	....	3	....	17
California	16	14	....	2	....	571	884	1	....	....	1	....	90
Colorado	....	....	....	....	....	12	15	....	....	....	....	....	....
Florida	....	....	....	....	....	....	1	....	....	....	....	....	....
Georgia	....	....	....	....	....	2	1	....	....	....	....	....	2
Illinois	36	19	....	17	....	1,654	3,052	10	2	....	8	....	466
Indiana	9	3	....	6	....	303	419	2	....	....	2	....	77
Iowa	....	....	....	....	....	....	5	....	....	....	....	....	....
Kansas	34	13	3	18	....	1,290	1,771	9	1	....	8	....	285
Kentucky	....	....	....	....	....	113	264	....	....	....	....	....	28
Louisiana	17	10	2	5	....	756	1,202	5	....	1	4	....	119
Michigan	17	7	1	9	....	544	649	5	....	....	5	....	140
Mississippi	2	....	....	2	....	90	164	2	....	....	2	....	32
Missouri	....	....	....	....	....	24	61	....	....	....	....	....	....
Montana	....	....	....	....	....	163	168	....	....	....	....	....	....
Nebraska	....	....	....	....	....	28	74	....	....	....	....	....	14
New Mexico	7	6	....	1	....	321	300	....	....	....	....	....	37
New York	....	....	....	....	....	964	757	....	....	....	....	....	1
Ohio	22	3	14	4	1	872	1,352	....	....	....	....	....	....
Oklahoma	25	8	1	12	4	1,133	1,730	7	....	....	7	....	234
Pennsylvania	38	33	4	....	1	3,124	3,159	....	....	....	....	....	....
Tennessee	....	....	....	....	....	8	16	....	....	....	....	....	....
Texas	73	36	2	28	7	4,387	8,185	13	2	....	11	....	867
Utah	....	....	....	....	....	....	2	....	....	....	....	....	....
Virginia	....	....	....	....	....	1	....	....	....	....	....	....	....
Utah	....	....	....	....	....	....	2	....	....	....	....	....	....
West Virginia	13	4	6	2	1	586	550	....	....	....	....	....	....
Wyoming	....	....	....	....	....	78	113	....	....	....	....	....	3
Total this week	317	160	33	109	15	17,136	25,029	57	5	1	51	....	2,417
Total last week	367	197	40	112	18	16,818	24,257	54	8	1	45	....	2,360
Total this year	17,136	8,841	1,468	4,469	2,358	.....	.....	2,417	303	37	2,069	8	.....

* Includes old wells deepened, water intake, gas input, salt water disposal, and distillate wells.
‡ OPC program calls for 4,000 wildcats in 1942, of which 624 should produce oil and 116 gas, leaving 3,260 dry.

Oklahoma

Okfuskee County Gets New Hunton Lime Pool

Hunton lime productive in Okfuskee County wildcat. Lucien has shallow pay while new pay is indicated in Kendrick area.

Discovery: A new Hunton lime pool has been proven at Mid-Continent Petroleum's Reed 1, NWc SE 30-12-7e, Okfuskee County, which perforated with 35 shots, 4250-4259½ ft, to flow 50 bbls day natural. Tubing is being run for acid treatment. No water is showing. Seminole County has another Hunton discovery at J. E. Hall's Stockton 1, SE NE SE 2-6n-5e. Well perforated opposite Hunton, 71 shots between 4143-4175 ft and after treatment with 1000 acid swabbed 30 bbls 24 hours. After retreatment with 2000 acid, well flowed 5 bbls hourly through ⅛-in tubing choke, no water.

Noble County: A new pay has been proven for North Lucien at Danciger's Plummer 1, C SE NE 5-20-2w, which plugged back from Wilcox to Misener sand, 5196 to 5201 ft to flow 9 bbls hourly on initial test.

Lincoln County: Wilcox sand is returning good shows in a wildcat in the Kendrick area at Creekmore-Rooney's Souther 1, C NW SE 33-16-5e, in which casing is being run to test the sand, 4346 to 4356 ft.

Coal County: Jesse pool has been extended east by W. A. Delaney's Gipson 1, SW SE NE 7-1n-8e, which has been testing for 30-60 bbls daily from Hunton lime, 3715-3726 ft. After acid well flowed 38 bbls hourly on incomplete test.

Caddo County: The ninth deepening operation by Texas Co. has resulted in a sharp increase in production at their Mulkahay 1, SW SW SE 2-5n-12w, Apache field. Well originally completed at 3490 in Simpson-Bromide and has been deepened to 3614 for a potential of 5132 bbls through 1-in tubing choke.

OKLAHOMA FIELD COMPLETIONS

Carter County—Tussy: Skelly's Miller 6, ne se ne 5-1s-3w, perf 2920 ft, pump 250 bbls, 2920 ft.

Lincoln County — Unnamed: Magnolia's Perkins 1, sw ne sw 31-14n-6e, Sylvan 4620 ft, abnd 4630 ft.

Logan County—Guthrie: Fain & Porter's Howland 1, ne sw sw 8-17n-1w, Wx 5492 ft, abnd 5660 ft.

Continental et al's Bennett 1, se se se 5-17n-2w, 2nd Wx 5842 ft, abnd 5849 ft.

Logan County — Crescent: Continental's Smith 2, sw sw ne 34-17n-4w, Lay 4916 ft, flow 63 bbls, 4933 ft.

Okmulgee County—Aztec: Bryant & Moffett's Jacobs 1-A, c se sw 6-11n-12e, Dutcher 2280 ft, abnd 2415 ft.

Okmulgee County—Morris: Link Oil Co.'s Fixico 3, c sw nw 34-13n-14e, Wx 2237 ft, abnd 2659 ft.

Osage County—Hominy: Ohio Osage Oil Co.'s Osage 2, ne sw ne 32-22n-9e, Burgess 2199 ft, 8,250,000 gas, 2240 ft.

Osage County—Avant: J. E. Cooper's Osage 4, c nw ne 25-24n-11e, Burgess 1740 ft, pump 5 bbls, 1753 ft.

Osage County—Pershing: Authur Oil Co.'s Osage 1-A, c n½ ne ne 8-25n-12e, Bart 1695 ft, shot 50 qts, pump 1 bbl oil & 1 bbl wtr, pb to 1780 ft, td 1846 ft.

Pottawatomie County—Maud: Mid-Continent's Lovelace 2, nw ne se 12-8n-4e, Viola 4279 ft, 10,000 gals acid, pump 46 bbls, 4323 ft.

Seminole County—S. Konawa: American Oils, Inc.'s Swan 1, sw ne se 3-5n-5e, Senora lime 2023 ft, pb to 2300 ft, rip csg, shot 20 qts, pump 20 bbls, td 2790 ft.

Stephens County—West Loco: H. J. Brown et al's Lowery 2, ne sw nw 8-3s-5w, pump 34 bbls, 1175 ft.

Stephens County—Velma: Skelly's Selby 36, ne sw sw 26-1s-5w, sand 757-67 ft, pb to 767 ft, pump 8 bbls oil 12 hrs, 771 ft.

OLD WELLS DEEPENED

Caddo County—Apache: Texas Co.'s O. Maynanonah 1, sw sw ne 2-5n-12w, otd 3600 ft, Bromide 3757 ft, flow 585 bbls 3 hrs, 3757 ft.

Creek County—Big Pond: Magnolia's Lewis 4, sw ne sw 30-15n-8e, otd 3223 ft, 2nd Wx 3834 ft, abnd 3865 ft.

Okfuskee County—Olympic: Sinclair Prairie's Carolina 2, nw nw sw 31-10n-9e, otd 1752 ft, sd 1717-52 ft and 1759-80 ft, shot 60 qts, pump 10 bbls oil, 8 wtr, 1780 ft.

Osage County — Turley: T. A. Gillespie's Osage 24, nw ne ne 8-20n-12e, otd 2115 ft, 1000 gals acid, pump 70 bbls oil, 30 wtr, 2124 ft.

OKLAHOMA WILDCAT COMPLETIONS

Comanche County—Failure: Roy E. Cooper's Bowne 1, se nw se 29-2n-9w, abnd 1663 ft.

Kay County—Failure: Bogan's Vansellous 1, c sw sw 27-25n-1e, temp abnd.

Logan County—Failure: Continental et al's Bennett 1, se se se 5-17n-2w, Pawnee 2238-2345 ft, L. Pawnee 2504-25 ft, Avant 2738-60 ft, Dewey 3828 ft, Hogs 4478 ft, Cob 4640 ft, Miss 5273 ft, Wood 5395 ft, Mise 5455 ft, Hunton 5466 ft, Syl 5487 ft, Viola 5580 ft, Dense 5600 ft, Dolo 5660 ft, 1st Wx 5709 ft, 2nd Wx 5824 ft, abnd 5849 ft.

Osage County—Failure: Midco's Osage 1, nw ne se 19-24n-8e, abnd 2923 ft.

Payne County—Failure: Wilcox O&G's Howell 1, nw se se 14-17n-3e, Lay 2863 ft, Ccb 3097 ft, Cleve 3139 ft, Osw 3568 ft, Verd 3232 ft, pink lime 3877 ft, Miss 4160 ft, Wood 4318 ft, Syl 4358 ft, Dolo 4494 ft, 2nd Wx 4506 ft, abnd 4549 ft.

Pawnee County—Failure: Keener O&G's Glen 1, ne ne nw 27-21n-5e, Hogs 1985 ft, Prue 3060 ft, Oread 920 ft, Avant 1355 ft, Hogs 1985 ft, Ccb 2245 ft, Cleve 2393 ft, Paw 2670 ft, Peru 2804 ft, Osw 2845 ft, Verd 3105 ft, Skinner 3120 ft, pink lime 3165 ft, Redfork 3180 ft, Inola 3210 ft, Bart 3222 ft, abnd 3223 ft.

Pontotoc County—Failure: Blackwell O&G's Gilmore 1, nw se sw 4-3n-5e, Calvin 790-837 ft, Cromwell 918 ft, Penn Caney 932 ft, abnd 1060 ft.

OKLAHOMA WILDCAT STARTS

Lincoln County: Creekmore-Rooney's Southers 1, c nw se 33-16n-5e, Ccb 2621 ft, dr 3190 ft.

Logan County: Eason & Grisso's McDonald 1, ne nw nw 15-17n-1w, dr 1000 ft.

Noble County: Deep Rock's Dailey 1, se nw ne 10-22n-2e, dr 2060 ft.

Oklahoma County: Ace Gutowsky's Wagoner 1, nw nw sw 32-14n-4w, rig.

Osage County: Norbla & Sinclair's Osage 1, sw sw ne 4-26n-5e, lcn.

Payne County: Lewis Prod. Co.'s Nessling 1, c ne sw 24-18n-1w, sp, Bird Creek 1890 ft, Deer Creek 2020 ft, Lecompton 2220 ft, U. Hoover 2260 ft, L. Hoover 2460 ft, Oread 2670 ft, Indicott 2730 ft, Avant 3240 ft, Dewey 3350 ft, Perry gas sd 3430 ft, dr 3550 ft.

Kansas

McPherson Discovery Makes Large Flow Test

McPherson discovery is big well; edge failure for Lindsborg; third producer for Merten in Reagan sand; another try near McCarty field; incomplete test indicates new field for Harvey.

McPherson County: Final testing of Westgate-Greenland Oil's Lilly 1, CS½ SW SE 30-17-1w, south of Roxbury field, which filled casing from Mississippi chat to open a new field showed for a big well from 2656-2668 ft when it gained maximum potential of 3000 bbls daily.

In same county, Auto-Ordnance's Melander 1, C SW NW 9-17-3w, northeast edge of Lindsborg, has been plugged after testing Viola and Simpson to delimit pool in this direction.

Barton County: Helmerich & Payne's Merten 2, C SE SW 3-19-15w, third well in the field, is showing 4,000,000 cft gas and 15 bbls oil from Reagan sand.

Harvey County: H. M. Williams et al's Stuckey 1, SE NE NE 3-23-3w, northeast of Burton field, has indicated a new field in Mississippi, 3188 to 3262 ft. Upon drilling plugs oil rose well into hole; testing incomplete.

KANSAS FIELD COMPLETIONS

Barton County—Kraft Prusa: Magnolia's Riemann 4, c nw se 4-17s-11w, lcn abnd.

Ash & Crown's Radenberg 2, ne ne se 5-17s-11w, Arb 3318 ft, swab 67 bbls oil 3 hrs, 3000 bbls, 3326 ft.

Shell's Barth 2, ne ne sw 15-17s-11w, Arb 3263 ft, pb 3279 ft, 2000 gals acid, pump 583 bbls, 3285 ft.

Barton County—Otis: Appleman & Wakefield's H. C. Bird 1, sw sw sw 33-18s-15w, Reagan 3571 ft, abnd 3680 ft.

Cowley County — Henderson: Earl Wakefield's Campbell 1, c se se 22-32s-3e, Arb 3419 ft, flow 123 bbls, 3425 ft.

Ellis County—Burnett: N. Appleman's Carmichael 3, sw nw ne 11-11s-18w, Arb 3529 ft, abnd 3539 ft.

Graham County—Morel: Barnsdall's Dabignon 1, c sw sw 11-9s-21w, Arb 3736 ft, 2000 gals acid, pump 429 bbls, 3762 ft.

Greenwood County—Beaumont: K. T. Weidemann's Lewis A-17, c nw ne 35-27s-8e, Miss 2503 ft, 2000 gals acid, pump 100 bbls, 2512 ft.

Jefferson County—McLouth: O. J. Connell's Mossberger 2, c nw ne 28-9s-20e, Miss 1420 ft, abnd 1452 ft.

McLaughlin's Miller 2, nw se ne 28-9s-20e, McLouth 1337 ft, pay 1354 ft, 2,750,000 gas, 1369 ft.

Workman's Old Line Ins. Co. 1, c nw se 28-9s-20e, McLouth 1430 ft, pb to 1440 ft, 800,999 gas, 1470 ft.

Jefferson County — Oskaloosa: Sherrod's Bower 2, c n½ sw ne 5-10s-20e, Miss 1525 ft, pay 1643-48 ft, pump 35 bbls, 1648 ft.

Leavenworth County—McLough: Mossbacker's Bell 3, c e½ se 1-10s-20e, McLouth 1385 ft, 7 mcf gas, 1396 ft.

Marion County—Lost Springs: Ring Mac's Kronpa 1, c w½ nw se 4-18s-4e, Miss lime 2470 ft, abnd 2485 ft.

McPherson County—Lindsborg: Bay Pet.'s Fagenberg 2, c ne nw 8-17s-3w, Simp 3457 ft, 2261 bbls, 3468 ft.

Phillips County—Dayton: Carter's Dusin 3, c sw se 35-2s-19w, Lans 3167 ft, abnd 3360 ft.

Pratt County—Iuka Area: Atlantic's Apperson 1, c nw sw 14-27s-13w, Arb 4496 ft, abnd 4530 ft.

Reno County—Schweizer: Amerada's Bailey 1, sw se ne 36-22s-10w, Cherty Dolo 3710 ft, pb 3716 ft, perf csg, 5000 gals acid, swab 55 bbls oil, 358 wtr, abnd 3724 ft.

Rice County — Smyres: Mercury Drlg. & Bradley Bros.' Inde 1, ne se se 23-19s-6w, Miss chat 3319 ft, abnd 3363 ft.

Rice County—Keesling: Bay Pet.'s DeWitt 2, c sw se 9-20s-9w, Arb 3254 ft, 1000 gals acid, pump 15 bbls, 3260 ft.

Rooks County—Dopita: Phillips and Continental's Elsie 1, c se sw 30-8s-17w, Arb 3453 ft, abnd 3485 ft.

Russell County—Hall-Gurney: R. H. Shields' Giese 6, c n½ se ne 28-14s-13w, Lans 2901 ft, pay 2903 ft, 10,000 gals acid, pump 1057 bbls, 2927 ft.

Russell County—Greenvale: Jones & Shelborne's Major 4, ne sw ne 4-15s-12w, Sooy 3183 ft, pay 3190-95 ft, pump 522 bbls, 3203 ft.

Russell County—Trapp: Phillips' Kramer 3, c sw nw 14-15s-14w, Arb 3338 ft, 500 gals acid, 2304 bbls, 3343 ft.

Stanolind's John J. Mai 1, c ne sw 22-15s-14w, Arb 3366 ft, abnd 3378 ft.

Russell County—W. Trapp: Phillips and Continental's Krug 4, c ne se 15-15s-14w, Arb 3343 ft, 500 gals acid, pump 210 bbls, 3346 ft.

KANSAS WILDCAT COMPLETIONS

Atchison County—Failure: Hatcher-Fisk's Warner 1, c nw sw 19-7s-17e, Miss 2015 ft, abnd 2031 ft.

Kearny County—Failure: Parker Drlg. & Stanolind's Dryley 1, se sw nw 28-23s-37w, Anhy 2050 ft, Lans 4050 ft, Cherokee 4350 ft, Miss 4896 ft, abnd 5204 ft.

Pawnee County—Failure: Cities Service's Peters B-1, ne ne sw 29-20s-18w, Lans 3640 ft, Arb 4021-90 ft, abnd 4090 ft.

Herndon Drlg.'s Harter 1, nw sw sw 15-21s-18w, Anhy 1160 ft, Herr 2115 ft, Ft. Riley 2236 ft, Heebner 3515 ft, Base Oread 3553 ft, Lans 3589 ft, Base KC 3900 ft, Arb 4019 ft, Porous 4036-40 ft, abnd 4061 ft.

Reno County—Failure: Bay and Texon et al's Keddie 1, sw ne ne 25-23s-10w, Anhy 1338 ft, Topeka 2764 ft, Lans 3268 ft, Base KC 3547 ft, Cong 3580 ft, Cherty Cong 3643 ft, Miss 3659 ft, Kinderhook 3669 ft, Viola 3816 ft, Dolo 3819 ft, Simp 3922 ft, Arb 3985 ft, Por 3990-96 ft, abnd 4010 ft.

Helmerich & Payne's Tonn 1, c nw se 29-25s-5w, Topeka 2205 ft, Lans 2780 ft, Miss 3458 ft, Viola 3887 ft, Kinderhook 3790 ft, Chas Sh 3850 ft, Viola 3887 ft, Simp 3910 ft, Arb 4010 ft, abnd 4060 ft.

Rice County—New Field: Harwood's Proffitt 1, ne ne nw 25-19s-10w, 567 bbls, 3284 ft.

Russell County—Failure: Herndon Drlg. et al's Kunz 1, se se nw 19-14s-15w, Anhy 918 ft, Topeka 2803 ft, Lans 3085 ft, Arb 3365 ft, abnd 3385 ft.

Saline County—Failure: Phil-Han and Adair & Norton's Jeulfs 1, ne sw ne 31-15s-1w, KC 2071 ft, Miss 2708 ft, Poro 2721-30 ft, abnd 2760 ft.

KANSAS WILDCAT STARTS

Barton County: N. Appleman et al's Stull 1, c s½ se sw 6-16s-12w, sur.

Cowley County: Summit Drlg.'s McKnab 1, c ne nw 35-31s-4e, lcn.

Wolf Creek's Hawley 1, c sw se 9-35s-4e, rust.

Edwards County: N. Appleman et al's Malin 1, ne ne se 13-25s-18w, mit.

Ellis County: N. Appleman and Chet Rob-

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erts' Wade 1, se se nw 12-11s-19w, mi drk.
McPherson County: Dickey's Decker 1, c w½ nw se 7-21s-1w, mit.
Russell County: Hollow Drlg. and N. Appleman's Dumler 1, sw se sw 5-14s-13w, mit.
Saline County: Veeder Supply's Carson 1, se sw nw 28-16s-3w, lcn.
Stafford County: Cities Service's Walker 1, ne ne se 10-24s-14w, lcn.
Wallace County: Sinclair Prairie's Wallace 1, c s½ se se 22-11s-39w, dr 4094 ft.

New Mexico

Square Lake Field Has Four Completions

Square Lake field of Eddy County accounts for 4 out of state's 7 completions for week, while 1 each is furnished by Grayburg pool, Eddy County, and Arrowhead and Cooper, Lea County. Only new wildcat reported is in San Miguel County.

Lea County: George P. Livermore's wildcat, Maxwell-State 1, 10 miles northwest of Lovington, C NW NW 26-15s-34e, which had small shows oil around 5250 ft, was drilling in hard lime at 5510 ft. R. Olsen Oil Co.'s and Atlantic's Langlie 1, projected 8000-ft test 4 miles northeast of Jal, C SE SE 11-25s-37e, cored oil-stained dolomite around 4310 ft and proceeded in lime at 4560 ft. Ohio Oil Co.'s wildcat, McCormick-State 1, C NE NE 36-9s-37e, 25 miles west of Duggan-Slaughter field, which tested gas and trace of oil at 4975-5000 ft, was drilling lime below 5250 ft.

NEW MEXICO FIELD COMPLETIONS

Eddy County—Grayburg: Aston & Fair's Arnold 2-I, cent sw nw 26-17s-30e, flow 720 bbls, open 2-in, after shot 200 qts 3172-3250 ft, lime 3220-3235 ft, td 3250 ft.
Eddy County—Square Lake: Barney Cockburn's Etz 12, c ne se 35-16s-30e, flow 170 bbls, open 2-in, after shot, 100 qts 2984-3085 ft and 100 qts 3147-3195 ft, td 3204 ft.
Barney Cockburn's State 8, c se sw 36-16s-30e, flow 180 bbls, open 2-in, after shot, 180 qts 2953-3022 ft, td 3025 ft.
Evarts Drlg. Co.'s Grier 5, c ne ne 31-16s-31e, flow by heads 18 bbls, open 2-in, after shot, 180 qts 3150-3256 ft.
Nay Hightower's Grier 4, c se nw 31-16s-31e, junked and abnd 2390 ft.
Lea County—Arrowhead: Gulf's Leonard 5-C, c ne nw 36-21s-36e, flow 276 bbls, open 2-in, lime 3740-3800 ft.
Lea County—Cooper: Skelly et al's J. W. Cooper 2, c nw sw 12-24s-36e, flow 108 bbls, open 2-in, after shot, 300 qts 3586-3670 ft, td 3675 ft.

NEW MEXICO WILDCAT START

San Miguel County: Fields & Dunaway's State 1, c nw ne sw of sec 14-14n-13e.

West Texas

Pecos County Wildcat Projected to Ordovician

New wildcat in Pecos County will test 7500-ft Ordovician horizon. Southeastern Terry County wildcat unsuccessful. Half-mile north extension of Means field, Andrews County, to be attempted; and development of Embar deep pool, same county, proceeds.

Pecos County: Magnolia has made location for a 7500-foot Ordovician wildcat test between Pecos Valley and Abell pools, latter of which has deep pay. Same company's Alan Robertson 1, T&StL 16, Block 142, wildcat 13 miles northwest of Fort Stockton, preparing to test prospective gas in Middle Permian at 6510-61 ft, elevation 2685 ft, was bailing out rotary mud near bottom after drilling plugs with cable tools from 7-in at 6475 ft. Phillips Petroleum Co.'s Price 1, 28 miles southeast of Fort Stockton, contracted to 8500 ft, was drilling lime at 4952 ft. Gruber & Ringle's wildcat, University 1, Section

19, Block 16, 1½ miles north of Taylor-Link pool, was a failure at 1580 ft.

Crane County: Skelly Oil Co.'s Ordovician wildcat, Richardson 1, H&TC 5, Block 31, 2½ miles northwest of Girvin, southeast part of county, 7 miles northwest of Wentz pool, awaited orders at 5743 ft in lime after having had small shows in upper Simpson, which was entered below 5200 ft. Gulf Oil Corp. was moving in materials to locations of Ordovician wildcats, M. Dawson 1-A, 5 miles west of McCamey pool, and W. A. Estes 1, 3 miles west of Sand Hills Ordovician pool. Gulf's Tubb B-7, Sand Hills Deep pool, started Railroad Commission test and yielded 281 bbls in 1 hour from Ellenberger lime at 5676 ft. Magnolia's Lea 2, south edge northeast Sand Hills field, was completed as a producer.

Andrews County: Seeking to extend Means field regular pays ½ mile north, Humble made location for Shultz 1, 4500-ft test, 660 ft out of southwest corner of PSL 5, Block C-45, Atlantic's University 1-A, wildcat 12 miles south of Fullerton field, which topped Simpson around 9800 ft, was drilling lime and shale at 10,095 ft, probably still in Simpson. Phillips Petroleum Co.'s University-Andrews 12, ¾ mile northwest of Ellenburger production of Embar pool, showed sulphur water on drill-stem test in Dolomite at 8120-8195 ft, after entering Ellenburger 370 ft low at 8133 ft, elev 3277 ft. Stanolind's University 1-W, Ordovician test 1¼ miles northwest of Phillips' discovery well, was drilling chert at 8376 ft. Phillips' University-Andrews 21, a mile west of Embar deep production, was drilling in Simpson lime and shale, no shows, a little below 8000 ft; and on same lease, Phillips' No. 9 was drilling at 7675 ft, No. 10 at 7650, No. 11 below 7500 ft. Union Oil of California was drilling brown lime at 4633 ft in Means 1-C, wildcat 3 miles southeast of Shafter Lake.

Lubbock County: J. R. Sharp's Elliott 1, on Shallowater prospect in northwest part of county, having reached 6404 ft under 6400-ft contract, was due to make drill-stem test of traces of porosity at 5475-5587 ft before abandonment.

Gaines County: Shell's Leaverton 1, 7500 ft wildcat 4 miles southwest of Wasson field, was drilling lime at 5382 ft.

Scurry County: Humble's Newman 1, projected 8000-ft wildcat, 9 miles northwest of Snyder, drilled lime and shale at 6208 ft.

Winkler County: Shell's Blue, Ordovician wildcat, T&P 15, Block 46, T-1-S, 17 miles northeast of Shell's Sealy-Smith deep discovery well, was drilling lime at 4860 ft.

WEST TEXAS FIELD COMPLETIONS

Andrews County—West Fuhrman: Mid-Continent's University 1, 660 ft fr w and 614 ft fr s lines sec 2, blk 10, University sur, semi-wildcat, w outpost, flow 121 bbls, 5/16-in, shot 230 qts, 4506-4618 ft.

Andrews County—West Andrews: Mid-Continent's University 1-A, sec 7, blk 10, University sur, pb 4520 ft, pump 74 bbls oil, 8 water, shot 340 qts 4458-4517 ft, lime 4458-4520 ft, td 4532 ft.

Crane County—Sand Hills: Magnolia's Lea 2, 1980 ft fr s and w lines PSL 9, blk 32, s edge ne Sand Hills pool, flow 520 bbls, ½-in, td 4546 ft.

Gaines County—Wasson: Amon G. Carter's Langdon 2-A, 660 ft fr n and e lines PSL 43, blk AX, flow 359 bbls, 21/32-in, 4000 gals acid, lime 4885-5000 ft.

Carter & Phillips' Wasson 4-A, 660 ft fr n and 1980 ft fr e lines of PSL 53, blk AX, flow 420 bbls, 17/32-in, 4000 gals acid, lime 4916-4926 ft, td 4970 ft.

Hockley County—Slaughter: Devonian Oil Co.'s Hudgens 6, 1732 ft fr s and 440 ft fr w lines of lse in PSL 8, blk X, flow 1394 bbls, 11,800 gals acid, lime 4987-5033 ft.

Western States Gasoline Co.'s Mallet 14-B, 510 ft fr n and e lines of Lab 20, Lge 50, Scurry Co. School Lands, flow 930 bbls, 11,750 gals acid, lime 4980-5038 ft.

Western States Gasoline Co.'s Mallet 18-B, 510 ft fr s and e lines Lab 1, Lge 50, Scurry Co. School Lands sur, flow 1060 bbls, 11,500 gals acid, lime 4957-5017 ft.

Pecos County—Walker: Cardinal Oil Co.'s University 2-C, sec 25, 830 ft fr e and 1728 ft fr n lines sec 25, blk 16, Univ sur, flow 62 bbls, shot 70 qts, 2015-2030 ft.

Upton County—Gulf-McElroy: Texas Pacific Coal & Oil Co.'s Bell 3-A, 1980 ft fr n and e lines of sec 4, J. H. Gibson sur, pb 3222 ft, pump 73 bbls oil and 5% water, shot 900 qts 2965-3220 ft, td 3311 ft.

Ward County—Magnolia-Sealy: Sam Weiner's Sealy 2, G&MMB&A 47, blk F, abnd 3032 ft.

Winkler County — Weiner: Ralph Lowe's Brown & Altman 10, 1650 ft fr s and 1980 ft fr e lines PSL blk B-5, flow 240 bbls, 1-in, shot 290 qts 3069-3170 ft, lime 3069-3178 ft.

Yoakum County — Wasson: Texas Pacific Coal & Oil Co.'s Bennett 37, 330 ft fr w and 2310 ft fr s lines of sec 630, blk D, J. H. Gibson sur, flow 622 bbls, open 2-in, 10,000 gals acid, lime pay 5120-5259 ft.

WEST TEXAS WILDCAT COMPLETIONS

Pecos County—Failure: Gruber & Ringle's University 1, 1767 ft fr s and 467 ft fr e lines, sec 19, blk 16, Univ sur, 1½ mi n Taylor-Link pool, abnd 1580 ft.

Terry County—Failure: Continental's Auld 1, 1980 ft fr n and w lines D&SE 91, blk 4-X, abnd 6870 ft.

WEST TEXAS OLD WELL DEEPENED

Ward County—Shipley: J. H. Snowden et al's Wristen Bros. 1-A, H&TC 18, blk 5, pump 81 bbls, lime 2420-2607 ft.

WEST TEXAS WILDCAT STARTS

Menard County: Al Tolbert's Wilkinson 1, 660 ft fr s and e lines of sec 55, Jno. H. Gibson sur, abst 290, 11 mi nw Menard, lcn for 4000 ft test, B. A. Duffy, Abilene, contractor.

Mitchell County: W. D. Casebolt's Chas. Thompson 1, T&P 53, blk 25, 660 ft fr n and e lines of sec, 3 mi sw of Loraine, lcn 4000-ft test.

Pecos County: Magnolia's Eaton 1, 2970 ft fr ne and 990 ft fr se lines H&TC 29, blk 3, 1½ mi ne shallow Pecos Valley pool and 7 mi sw of Abell pool, lcn 7500-ft test.

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West Central Texas

Locations Announced for Wildcat and Extension Try

Location staked for Taylor County wildcat 3½ miles southwest of Merkel pool. Reddin pool of same county provided second oil well, and another test there misses Flippen pay but will go to Lower Hope, while location is made for southwest extension test. In Jones County, Wimberly field has a completion, and Akard pool extension to southwest will be attempted.

Taylor County: A new test has been started in the 2-well Reddin pool, nearly 2000 ft southwest of the discovery well, which was completed a month ago. Butler & Horne Drilling Co. and Geochemical Surveys have begun moving materials to the site for the new test, S. M. Reddin 1-A, 330 ft from the east and 700 ft from the north lines of a 135-acre tract in the J. A. Nabors survey No. 9. Same operators completed Hudson 2, 1000 ft south of the discovery well, as the field's second producer, its location being 780 ft from the west and 519 ft from the north lines of the tract in J. A. Nabors survey. Hudson 2 tested 50 barrels of 39.6-gr oil in a 1-hr test from the Flippen lime pay at 2232-2239 ft. Due west of the Reddin discovery well 1110 ft, in W. H. Frazier 1, above operators missed the Flippen and were proceeding at 2380 ft toward the Lower Hope, which was expected around 2408 ft. Frazier 1 is 330 ft out of the southeast corner of a 176-acre lease in T&P 26, Block 17. Contracted as a 3200-ft rotary test, a wildcat will be drilled 3½ miles southwest of the Merkel pool, as shown below.

Jones County: An effort will be made to extend the Akard pool approximately 1900 ft southwest through drilling of Fain & McGaha's 2350-ft cable-tool test, Hedrick Oil Co. et al 1, which has been located 2250 ft from the north and 8875 ft from the west lines of the David T. Bruce survey 135. A new producing well was added in the Wimberly field through completion of S. C. Herring et al's W. P. Mashburn 2, which initially flowed at the rate of 600 bbls daily through ¾-in choke on tubing, from lime at 2330-2345 ft.

Comanche County: Limits of the Amity pool on the west side were better defined when L. H. Choate failed to get production in S. E. Graves 1 and T. C. Johnson 1.

WEST CENTRAL TEXAS FIELD COMPLETIONS

Brown County: G. Greynolds et al's J. W. Newton 1, BBB&C 25, abnd 1325 ft.

Comanche County—Amity: L. H. Choate's Graves 1, w edge of pool, 3180 ft fr n and 1566 ft fr w lines of ET 1, abnd 812 ft.

L. H. Choate's Johnson 1, w edge of pool, 233 ft fr s and w lines ET 2, abnd 746 ft.

Jones County—Wimberly: S. C. Herring et al's Mashburn 2, lot 86, Goodwin subd, DeWitt Co. School Lds 126, flow 600 bbls 41.5-gr, ¾-in, pressure 150 lbs, cas pressure 350 lbs, 2345 ft.

Palo Pinto County—Pickwick: Albert W. Adkisson's Allen & Ritchie 8, L. P. Pitts sur, flow 93 bbls, 36.5-gr, ½-in, tubing pressure 25 lbs, cas pres 75 lbs, 1499-1503 ft.

Shackelford County—Albany: C. B. Christie's N. P. Newell 1, TP 13, blk 11, pump 20 bbls, sand 1006-1018 ft, shale 1018-1020 ft, pb 1018 ft, td 1020 ft.

Taylor County—Reddin: Butler & Horne Drilling Co. and Geochemical Surveys' Hudson 2, J. A. Nabors sur, 50 bbls 39.6-gr, 1 hr, Flippen lime 2232 ft, td 2239 ft.

WEST CENTRAL TEXAS WILDCAT STARTS

Taylor County: Drilling & Exploration Co. et al's Gibson 1, 330 ft fr s and e lines of n half lot 8, Grimes C. School Lds 147, 3¼ mi sw Merkel pool, lcn 3200-ft test.

TEXAS PANHANDLE FIELD COMPLETIONS

Hutchinson County: J. E. Crosbie's Pitts 49, TC 9, blk M-21, shot 465 qts 2720-2820 ft, pump 176 bbls, td 2820 ft.

Goodwin & Parton's Hodges 5, H&OB 14, blk XO-2, shot 44 qts 2988-3093 ft, pump 49 bbls, td 3096 ft.

J. M. Huber Corp.'s Weatherly 22, A&B 26, blk Y, pb 2942 ft, shot 2750 gal acid, pump 112 bbls, td 2990 ft.

Skelly's Merchant 3, H&TC 34, blk 47, pb 2770 ft, pump 42 bbls oil, 10 water, td 2920 ft.

Moore County: Canadian River Gas Co.'s Reed 3-A, D&P 15, blk B-12, 28,000,000 gas, 2640 ft.

North Texas

Wise and Montague Tests Making Important Promises

North Texas apparently has two important new, deep, Bend-production oil fields in the making, judging by the fairly conclusive performance last week of wildcats in Wise and Montague counties, both having yielded some oil and having indicated potential ability to flow. Young County discovery well pumps 114 barrels oil daily.

Wise County: Stanolind's Menasco 1, 1½ miles northwest of Park Springs, 707 ft from east and 699 ft from south lines of Section 9, Falls CSL, continued swabbing and testing after favorable initial results in testing Bend section at 5790-5818 ft. Drilled to 7310 ft in dolomite, the well had 5½-in casing cemented at 5887 ft, and uncased hole was plugged off with cement, and plug in the pipe was drilled out to 5838 ft, after

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which casing was perforated with 250 shots from 5790 to 5818 ft. Swabbed through tubing for 6 hours, well yielded mud and water cut with oil, and fluid column was lowered from 700 to 2200 ft; then shut in overnight, and opened next morning, it blew gas for 8 minutes and filled flow lines with fluid; swab then was run, with fluid 1000 ft from top, and first trip resulted in recovery of 1000 ft oil and 1500 ft oil-cut mud. This well had only small shows in Simpson, which was topped at 6813 ft, but encountered numerous promising shows between 4900 and 5800 ft.

Montague County: Sinclair Prairie's Eanes 1, wildcat 7 miles southwest of Bowie and about 6 miles northwest of the above discussed Wise County potential discovery well of Stanolind, was bailing oil along with gas-cut mud, after gas and mud blew over the top of the derrick. Located 660 ft from south and west lines of the G. A. Bench survey A-1521, the well was drilled to 7070 ft in dolomite, with top of Ellenburger at 6913 ft, but 5½-in casing was cemented at 5993 ft to test shows around that depth. After perforating at 5937-5938 ft with 2 shots, the well showed gas and some fluid in hole, and after reperforating at 5932-5935 ft with 18 shots, fluid level stood at 3450 ft. Bailer then was run, resulting in previously mentioned blowing of gas and mud over derrick top.

Clay County: Youngblood & Foree's H. Sanzenbacher 1, wildcat 4 miles southwest of Henrietta, scheduled to go to 6400 ft, was drilling sand and shale at 4250 ft. Gulf's Worsham Est. 8, wildcat in H&TC 35, Block 4, was in shale at 5443 ft.

Jack County: Rathke Oil Co.'s Schnocke "Riley" A-1, wildcat 2 miles west of Joplin, in the southeast part of the county, A. Schnocke Survey A-2400, was drilling water sand at 5338 ft.

Archer County: Perry Browning's Fee 1, 5 miles southeast of Wichita Falls, and 1⅜ miles northwest of Vogtsberger pool, was testing at 5330 ft, having yielded some oil after acid treatment of Ellenburger, topped at 5220 ft.

Young County: Standard of Texas and Hanlon-Buchanan's Daws 1, 11 miles west and south of New Castle, discovery well of a new pool, after shut in for 37 hours, pumped 114 bbls oil and 150 bbls water in 24 hours. Same operators' Donnell 1, wildcat 4 miles northwest of Murray, southwest part of the county, was drilling hard lime and shale at 3912 ft.

NORTH TEXAS FIELD COMPLETIONS

Archer County: C. E. Morrison's Wilson 1, ATNCL 118, abnd 2235 ft.

Rathke Oil Co.'s (was Guy J. Scholls) Rogers 1, TE&L 1596, pump 2 bbls, sand 1264-73 ft, td 1278 ft.

W. R. Stafford's Richardson 2, W. C. McCune sur, Abst. 943, pump 8 bbls from sand at 1237 ft, after pb from 1284 ft.

J. H. & Stella White's White 2, Lot 15, ATNCL sur, blk 40, abnd 1464 ft.

White & Duncan's Richardson 4, MEP&P sur, pump 150 bbls, sand 1226-1232 ft.

Clay County—Spring: Continental's Spring 5, 4 mi sw Ringgold, 3829 ft fr e and 886 ft fr s lines of H&TC 23, blk 4, abnd 5752 ft.

Clay County: Geo. W. Graham et al's Roach 2, F. Longardio sur, sec 4, abst 287, abnd 1175 ft.

Sussex Oil Corp.'s Glasgow 32, 1410 ft fr ne and 330 ft fr se lines lot 34 of Bacon subdiv, pump 40 bbls, sand 1063-1070 ft.

Cooke County: T. F. Johnson's Welch 1, 5 mi n Muenster, 660 ft fr n and w lines of 116-ac tr in M. W. Ross sur A-553, abnd 1167 ft.

Jack County: Lesh & McCall's Henley 1, G. W. Tilley sur, A-734, 7 mi n St. Jo, abnd 2970 ft.

Taubert & McKee et al's Hoefle 1-B, lot 9, Jno. W. Barrett sur, abnd 547 ft.

Montague County—Davenport: Lesh & McCall's W. C. Henley Est. 1, 330 ft fr n and e lines, G. W. Tilley sur, abst 734, abnd 2970 ft.

Wichita County—KMA: W. H. Hammon's W. H. Hammon 14, ET 2, flow 375 bbls, shot 150 qts 4030-62 ft, td 4064 ft.

Hanlon-Buchanan's Murphree 1, Tarrant Co. School Lds sur, A-282, 1485 ft fr s and 330 ft fr w lines e ½ sec 22, 3 mi sw Iowa Park, abnd 2150 ft.

Young County: W. E. Prod. Co.'s Hunt 1, 1664 ft fr n and 1304 ft fr e lines TE&L 175, A-422, 2 mi w Olney, abnd 1150 ft.

E. D. Willis' Killan 1, 330 ft out swc of e 80 ac of s 146.6 ac in TE&L 220, 3½ mi s Olney, abnd 990 ft.

NORTH TEXAS WATER INPUT WELLS

Wichita County: Cable Oil Co.'s Willis 27-A-W, 200 ft out sec BBB&C sur A-29, sand 266-78 ft.

Cable Oil Co.'s Willis 28-A-W, 650 ft out sec BBB&C sur, sand 277-278 ft.

Cable Oil Co.'s Willis 29-A-W, 650 ft from s and 1750 ft from w lines BBB&C sur, sand 158-166 ft.

Cable Oil Co.'s Willis 24-B-W, 1000 ft from w and 1650 ft from s lines BBB&C sur, A-29, sand 250-259 ft.

NORTH TEXAS GAS INPUT WELL

Archer County: H. A. Rathke et al's (was Guy J. Scholl) Rogers 1, 330 ft out nec TE&L 1596, sand 1264-73 ft, td 1278 ft.

NORTH TEXAS SALT WATER DISPOSAL WELL

Clay County: Merrick & Goldsmith's Byers Bros. 1-W, sec 15, Byers Bros. subdiv, 1½ mi s Petrolia, sand 350-371 ft, td 374 ft.

NORTH TEXAS WILDCAT COMPLETIONS

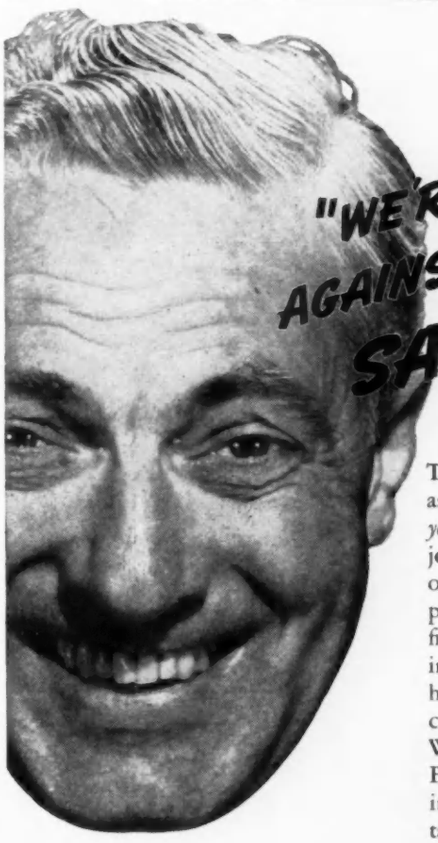
Archer County—Failure: Thweatt & Gray's Turbeville 1, 1650 ft from e and 990 ft from n lines blk 49, Harris subdiv, abnd 1190 ft.

Wilbarger County — Failure: W. T. Waggoner Est.'s W. T. Waggoner 1-JJ, 12 m s Harrold, 1320 ft fr s and 660 ft fr e lines of J. S. Calhoun sur, abst 944, KMA lime 3797 ft, Caddo 4070 ft, Chappell lime 4470 ft, Ellenberger 4500 ft, abnd 4572 ft.

NORTH TEXAS WILDCAT STARTS

Archer County: Bridwell Oil Co.'s Schreiber 1, 330 ft out sec of sec 34, Clark & Plumb sur, blk 4, lcn for 1200-ft test.

Wilbarger County: Frank Wood et al's W. T. Waggoner Est. 1, 330 ft fr n and 2970 ft fr e lines of H&TC 16, blk 5, lcn 1950-ft test.



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East Texas

Two Mile Extension Given Chapel Hill

Chapel Hill field of Smith County furnishes highlights with completion of 2-mile south outpost and a well within the field. Mixon prospect test, Cherokee County, at interesting depth. Deep Smackover lime test at Talco abandoned. New Coke field, Wood County, is active.

Smith County: Sinclair Prairie's Swinney 1, 2 miles south of the Chapel Hill field, Wm. Lockhart Survey A-563, was completed, flowing on gas lift 45 bbls 42-gravity oil daily from Pettit lime at 8150-8280 ft after acid treatment. Within the field, same company's Phillips 2, Parchman survey, was completed in Pettit for 403 bbls daily through ¼-in choke.

Cherokee County: Magnolia's Braly 1, Mixon prospect, east of Mt. Selman, was drilling in Rodessa lime and shale, no porosity, below 8300 ft.

Franklin County: Abandonment in salt at 9086 ft is the final report on J. B. White et al's Jackson 1, deep wildcat ½ mile north of Talco field, which found salt water in the Smackover lime that was topped at 8580 ft. Myers & Davis et al's wildcat, Cox 1, J. M. Gill survey, 5 miles north of Winnsboro, was drilling lime and shale below 5725 ft.

Anderson County: Magnolia's Campbell 2, ¼ mile northeast of No. 1, the discovery well of Concord field, was drilling a little below 3500 ft.

Wood County: Hawkins field gained a well when Humble completed Jackson-Chism 2, flowing 97 bbls 25-gr oil in 6 hrs through ¼-in choke from 4751-67 and 4812-22 ft.

Freestone County: Ohio Oil Co.'s Hill 1, wildcat 5 miles north of Butler in T. M. DuBronner survey, was drilling below 10,075 ft, probably in the Rodessa, encountering no shows.

Wood County: Delta Drilling Co. et al's Goldsmith 1, S. G. Purse survey, 3 miles northwest of Quitman, wildcat scheduled to test the Travis Peak, was drilling below 3750 ft. In the new 15-well Coke field, Amerada has made location for French 1, 467 ft from north and east lines of 94-acre tract in M. Y'Barbo survey, and for T. D. Yates 1, 467 ft from north and west lines of 55-acre lease in Jos. Knight survey. Amerada has 4 wells on 6250-6350 ft Paluxy pay sand, namely, Foster Unit Nos. 1 and 2, Kennemer 3, and McCreight 1, while J. D. Kennemer 1 is drilling below 2000 ft, and derricks are up for Bessie Conner Nos. 1 and 2.

Bowie County: P. D. Bowlin's Simms 1, Williams survey, Smackover lime test, is drilling below 6290 ft, probably in the Travis Peak, checking about level with Shell's failure northwest of Maud.

Cass County—Kildare: This area may be extended northward by Rogers Lacy's Little, Watson survey, which topped Gloyd zone 10 ft high, at 5994 ft, found 40 ft of pay and set casing to 6084 ft. The well was testing again through new perforation after first try showed too much gas.

Shelby County: Hurley & Vaughn's Frost 1, Waterman survey, deep test southwest of Center, was halted for repairs but will core ahead below 6712 ft, where hole is believed to be in the top of the Rodessa series.

Harrison County: Gilger Drilling Co. is moving in to drill Roy L. Fisher's Aguers 1, six miles southeast of Waskom, a Travis Peak test, between the Waskom and Bethany deep gas-distillate areas. The Waskom field's first oil producer, First National Petroleum Trust's Armstrong 1, Holloway survey, west outpost, was perforated again at an unannounced level in the oil sand and a new production test will be made.

Panola County—Carthage: Glassell & Glassell are testing again through perf at 5850-66 ft at Frost 4, Martin survey, which gauged 10,400,000 gas from perf at 4904-16 ft. Thomason and Turner's Hudson 1, Decker survey, was gauged at 12,350,000 ft on open flow from perf at 6082 to 6128 ft. W. C. Feazel's Burnett 1, Mallery survey, tested 1,000,000 ft from perf at 5840 to 5966 ft and resumed drilling below casing set at 6003 ft.

EAST TEXAS WILDCAT COMPLETIONS

Cherokee County—Larissa Discovery: Humble's Curtiss 1, 3 mi nw Larissa, 660 ft fr n and 866 ft fr w lines of 92.9 ac tr, or 3750 ft w and 660 ft s of sec of John Jordan sur, but in J. Vaughn No. 53 sur, plugged back and perf Pettit 10,160-10,200 ft, top Pettit 10,162 ft, elev 490 ft, flow 37 bbls 48-gr oil, ¼-in, tub pres 25-75 lbs, cas pres 450 lbs, td 10,487-10,611 ft.

Franklin County—Failure: J. B. White et al's W. H. Jackson 1, ½ mi n Talco field, 1600 ft fr s l and midway e and w lines of 175-ac lse, J. E. Hopkins sur; Pecan Gap 1630 ft, Blossom 2450, Sub Clk 2910-40, Geo 4115-45 or 4048-78, Paluxy 4978-5008, Glen Rose 5518-45, Mas Anhy 6667, Travis Pk 7270, Cotton Val 7515, Buckner 8098, Smackover 8580; water in Smackover, abnd 9082 ft.

Hopkins County—Failure: Clark Sample and Donnie's Welborn 1, 1½ mi se Como, 660 ft out swc 66-ac tr in J. Webb sur; Woodbine 4464 ft, Paluxy 6395 ft, abnd 6420 ft.

Hunt County—Failure: B. D. K. Oil Co.'s Fowler 1, 6 mi se Greenville, 700 ft n and 25 ft e of sec Peter Barrow sur but in T. R. Tennison sur, Woodbine 2908 ft, abnd 3010 ft.

Southwest Texas

Atascosa County Strike Cores Into Water Sand

Core into water in Atascosa County discovery. Production tests scheduled in Duval County wildcat.

Atascosa County: Humble is making completion test on Thompson 1, Edwards lime discovery in Imogene area, after having disappointment when a core was taken slightly below 3 ft of lime, and water was found. Only 3 ft of pay was found at 7573 ft, and a drill-stem test of this level showed considerable oil. When a second core was taken at this level sulphur water was found. Hole was plugged back to 7567 ft and underreaming is under way. This well, which set off a lease play along what is believed to be a new trend for the area, is bottomed at 7576 ft with casing cemented to bottom. Meanwhile, Humble is moving in to drill Soechting 1, 1800 ft northeast of Thompson 1.

Duval County: Taylor Refining Co. is making series of production tests on Garcua 1, wildcat 5 miles west of San Diego and 2 miles southeast of Muralla field. With 5½-in cemented to 6480 ft, operators recovered oil on drill-stem test at 4550-58 ft in Hockley, with other shows reported. Another test was made at 5246-53 ft in Pettus discovery pay, but this horizon showed salt water. This well, which is second for the area, is in southeast corner of Calletano Rios survey 306 on Sun farmout.

Aransas County: Continental is making flow tests on St. Charles 5, semi-wildcat 2100 ft northwest of St. Charles 2 discovery in St. Charles area. With 6-in set and the hole bottomed at 9859 ft, operators are testing a sand that produced gas-distillate in the discovery. Well is located in R. D. Blossman survey 196, 1600 ft northeast of St. Charles Bay shoreline.

Bee County: Magnolia is reported to have made last test in perf at 10,020-150 ft after shooting with 216 shots. The well flowed gas-distillate. Hole is bottomed at 10,561 ft with 5½-in set to 10,429 ft. It is reported the well flowed distillate from perf at 10,328-404 ft, then hole was plugged back to make this last test.

Goliad County: Ginther, Warren &

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Ginther are still fishing for stuck drill pipe in Wood 1, wildcat in Sarco Creek area, with 500 ft of pipe in hole at 4620 ft. This wildcat, in southeast corner of Domingo Morris grant, and 9 mi south of Goliad, tested distillate in sand at 4053-69 ft. Casing is on ground to make production test.

LOWER TEXAS COAST FIELD COMPLETIONS

Bee County—North Pettus: Union Producing's Ray 58, 3425 ft fr nwl of 15,563-ac tr, R. C. Ballard sur, 7-in 7010 ft, perf 6943-63 ft, flow 37 bbls dist, 18/64-in, td 7010 ft.

Jackson County — Mayo: Louis Crouch's Lundy 1, 467 ft fr nel & 467 ft fr wl A. Kountze sur 15, 200-ac lse, 7-in 5485 ft, 96 bbls, 5/32-in, td 6025 ft.

Jackson County—Texana: Houston Oil Co.'s Clement 1, 3262 ft fr n'ly nl of 370-ac lse, R. F. Clement subdvn of S. F. Austin 2-Lge grant, 5½-in 5758 ft, perf 5560-70 ft, 49,000,000 gas, td 5762 ft.

Jackson County — Maurbro: Humble's Pritchett 2, 1457 ft fr nl & 467 ft fr wl 300-ac lse, Abraham Clare sur, 5½-in 5201 ft, perf 5208-10 ft, 149 bbls, ⅛-in, td 5213 ft.

Jackson County—Mayo: Texas Co.'s Simicek 1, 467 ft fr n & el's 165-ac lse, M. L. York sur 12, A-313, 5½-in 5553 ft, perf 5420-26 ft, 125 bbls, ⅛-in, td 5600 ft.

Kleberg County—Stratton: Chicago Corp.'s Wardner 45, 8782-ac lse, Paso Ancho de Abajo gr, 5½-in 6607 ft, perf 6577-83 ft, flow 181 bbls, ¼-in, td 6615 ft.

Chicago Corp.'s Wardner 50, 11,943 ft se alg sel of 8782-ac lse fr ne cor of sec 19, Chas. Stratton subdvn, thence 466 ft w at ra to lcn in Paso Ancho de Abajo gr, 5½-in 6596 ft, perf 6588-95 ft, 154 bbls, ⅛-in, td 6624 ft.

LOWER TEXAS COAST WILDCAT COMPLETIONS

Bee County—Failure: Rodney DeLange and W. E. Rowe's White 1, 5120 ft fr sel & 1980 ft fr nel of Refugio County School Land, Tynan area, abnd 4706 ft.

Hidalgo County — Failure: Baldridge & King's Yturria Land & Livestock 1, 5 mi n Nichols field, 40-ac unit in porcion 43, abnd 4786 ft.

LOWER TEXAS COAST WILDCAT STARTS

Hidalgo County: Baldridge & King and LaGloria Corp.'s Daskam 2, 4 mi ne Nichols field, 660 ft fr n & wl's of lot 31, Daskam subdvn porc 45, 675-ac lse, lcn 5000-ft test.

Jackson County: John G. Mayo and Petroleum Well Servicing Co.'s Heard 1, ctr 40-ac unit of s 120-ac of 640-ac tr in Francis Menefee sur, 2 mi se Ganado townsite, lcn 6000-ft test.

SOUTHWEST TEXAS FIELD COMPLETIONS

Duval County—Tarancahuas: Plymouth Oil Co.'s Hoffman 4-C, 660 ft fr nel & 1980 ft fr sel of BS&F 109, abnd 3046 ft.

Jim Hogg County — Colorado: Humble's East 1, 1485 ft fr s'ly el & 672 ft fr s'ly sl of 1091-ac lse, Las Moritas gr, 5½-in 3081 ft, sand 3096 ft, 126 bbls, 3/16-in, td 3106 ft.

Live Oak County — Oakville: Henderson Coquat's Oakville School & Reagan 1, 330 ft nw alg nel fr e cor lot 4, blk 1, S. McGloin sur, 5½-in 2772 ft, sand 2767 ft, perf 2770-72 ft, 40 bbls, ¼-in, td 2772 ft.

Starr County—North Rincon: Sun's Hall-State 1, 1980 ft fr s & wl's of C. B. Simpson sur 100, abnd 5020 ft.

SOUTHWEST TEXAS WILDCAT COMPLETIONS

Duval County—Discovery: Taylor Refining Co.'s Cadena 1, 1477 ft fr el & 1200 ft fr nl of Calletano Rios sur 306, 7-in 5443 ft, sand (Pettus) 5269 ft, perf 5273-75 ft, jetted 63 bbls, 5/64-in, td 5862 ft.

Jim Hogg County—Failure: Sun's East 1-D, 3300 ft fr w'ly wl & 3300 ft fr s'ly nl of 4503-ac lse, s portion of Santo Domingo de Arriba gr, 26 mi sw Hebbronville, abnd 5303 ft.

SOUTHWEST TEXAS WILDCAT STARTS

Duval County: Argo Oil Corp.'s Scott 1, 660 ft fr nl & 1980 ft fr el of 157-ac lse, blk 30, E. Corkill sur 104, 8 mi se of Concepcion, lcn 6500-ft test.

Duval County: Henderson Coquat's Southland 5-C, 660 ft fr n & el's of 160-ac portion of C lse in blk 4, Santos Flores gr, 5 mi sw Benavides, lcn 6000-ft test.

SOUTH CENTRAL TEXAS WILDCAT STARTS

Atascosa County: J. A. Hardcastle's Kingsley 1, Pleasanton area, 2250 ft fr el & 650 ft fr sl of 457-ac lse in Nancy McAda sur 1550, lcn 2000-ft test.

Bastrop County: Marts & Beaven, Inc.'s Anderson 1, Elroy area, 1200 ft fr s & el's of 221-ac tr in Michael Green sur, dr.

Caldwell County: M. B. Kelley's Taft 1, Lost Mule area, 660 ft fr n & el's & 1320 ft fr wl of 105-ac tr in Jonathon Burleson sur, lcn 1800-ft test.

Gonzales County: Continental's Gatlin 1, Lone Oak area, 1980 ft ne alg nwl fr w cor 244-ac tr in William Newman sur, lcn 5500-ft test.

Texas Gulf Coast

Sidewall Samples Taken In Deep Wilcox Test

Sidewall samples taken in Montgomery County Wilcox well. Second well completed in deep sand at Danbury, Brazoria County.

Montgomery County: George W. Strake has been taking sidewall samples in Jones 1, wildcat on Willis prospect, bottomed at 10,509 ft and around 3460 ft inside Wilcox sand. Operators stuck drill pipe last week, but were successful in retrieving to run electrical survey and then take samples. Although definite information has not been released on what has been encountered in this wildcat, it is reported several sections have been found that may warrant production test. This well is in Timothy Cude survey.

Strake also is drilling and coring below 8460 ft in shale in Peel 1, another Wilcox wildcat 4 miles southwest of Willis. No important showings have been encountered.

On the Pinehurst prospect, LaGloria Corporation plans to drill to 11,800 ft in Grogan-Cochran 1, Wilcox test that is credited with finding shows to assure setting of casing for production test. This test was drilled to 10,300 ft, contract depth, but decision was made to drill deeper.

Brazoria County: Humble is completing Blakely 1, offsetting Rowan Drilling Co.'s deep sand discovery at Danbury. The well, located in HTB 14, is flowing from the 5600-foot sand. Total depth is 5830 ft, plugged back to 5670 ft.

Location: C. Andrade III has made location for a deep wildcat east of Lake Creek, Montgomery County. It will be a Wilcox operation, and is located 466 ft south of north line and 466 ft east of west line of Joseph T. Pyle survey.

Hebert & Smith are drilling in shallow formations in Conger 1, wildcat south of Nome in Liberty County.

TEXAS GULF COAST FIELD COMPLETION

Wharton County — Withers: Texas Co.'s Pierce 94-B, 6050 ft fr se & 6050 ft fr nel of 4041 ac lse, A. H. Pierce sur 642, perf 5535-38 ft, flow 61 bbls 22/64-in chk, td 5544 ft.

TEXAS GULF COAST WILDCAT COMPLETION

Polk County — Failure: Pan American's Texas Long Leaf 5-B, 520 ft nw of nwl of J. O. Bergman lse, A. Viesca 7-lge gr, A-77, abnd 4250 ft.

Louisiana Gulf Coast

Blowout Indicates New Field in Acadia Parish

Blowout indicates new field on Branch prospect, Acadia Parish. Wildcat on Krotz Springs prospect, St. Landry Parish, drilling ahead.

Acadia Parish: Union Sulphur Co. apparently is opening a new field in Branch area after Gueno 1, west of Crowley, blew out from 10,447 ft and started burning. Operators drilled into a sand at 10,437-447 ft and the well started kicking. Although rams were closed immediately the pressure started building up to 4000 pounds. Another gas sand was reported encountered at 10,410-420 ft which showed considerable kick. At last report Gueno 1 was still

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burning. Location of well is 3000 ft southeast, 660 ft southwest from north corner of 51-8s-2e, northeast of dry hole drilled by Humble previously to 10,000 ft.

St. Landry Parish: Gulf is drilling ahead in Hirsch 1, wildcat on Krotz Springs prospect, after setting protection string to around 8222 ft, total depth. This well will be carried to 10,000 ft. Details on what has been encountered in this wildcat have not been announced.

Stanolind's Haas 1, wildcat on Palmetto prospect in St. Landry Parish, 17-4s-6e, has been standing at 10,506 ft while engines are being repaired. This well was originally scheduled to drill only to 8000 ft, and operators have not announced whether it will be carried any deeper.

Calcasieu Parish: Union of California has projected another test on flank of Vinton dome, Gray 3-G, SEc N½ SW SW 33-10s-12w. Morris-Hamilton Drilling Co. is contractor on this projected deep test.

LaFourche Parish: Gulf has been cutting and pulling stuck drill pipe in Delta Securities 1, wildcat on Camp Bully prospect. Pipe was stuck around 1374 ft. Apparently, operators struck a cavity at this level and could not get returns on mud. It is believed this test is on a shallow salt dome. The well is projected to a shallow depth.

SOUTH LOUISIANA FIELD COMPLETIONS

Lafourche Parish—Leeville: Texas Co.'s LLE-Leeville 87, 3524 ft s & 2079 ft w of ne se 27 in 34-21s-22e, 5½-in 9456 ft, perf 8944-70 ft, 124 bbls, ⅛-in, td 9456 ft.

St. Charles Parish—Lake Salvador: Texas Co.'s State-Lake Salvador 17, n 39 deg 10 mins w 22,725 ft from USCGS Mon "In," in T-15s-22e, perf 9940-64 ft, 280 bbls, ⅛-in, td 10,253 ft.

SOUTH LOUISIANA WILDCAT COMPLETIONS

Terrebonne Parish — Discovery: Humble's Continental Land & Fur 2, fr nw cor sec 24-18s-12e, go 1980 ft s'ly alg wl, th 400 ft e'ly at ra in sec 24-18s-12e, Deer Island prospect, perf 9565-70 ft, dry gas, ¼-in, no gauge, td 10,253 ft.

SOUTH LOUISIANA WILDCAT START

St. Martin Parish: George H. Echols' Voorhies 1, Anse la Butte area, begin nw cor sec 72 go approx 5450 ft s 40 deg 45 mins w & 330 ft at ra, s 39 deg 15 mins e in sec 72-9s-5e, lcn 10,000 ft test.

North Louisiana

Bellevue Deep Test Drills Into Salt

Bossier Parish deep test halts drilling in salt and shows salt water on first drill-stem test of Cotton Valley series higher up hole. Winn Parish wildcat abandoned, another making production test. Unusually good pay section in Tullos-Urania field edge well, Grant Parish.

Bossier Parish: Phillips Petroleum Co.'s deep test in Bellevue field, Kendrick 1, C NE SW 22-19n-11w, ran into salt at 9046 ft, halted drilling at 9070 ft and made drill-stem test in Cotton Valley series, between 6465-70 ft, and recovered only 150 ft of mud and 550 ft of salt water. Lower horizons will be tested. During drilling, a drill-stem test of the Cotton Valley lime showed 420 ft of light oil in 45 minutes.

Winn Parish: Placid Oil Co. abandoned its Davis 1, C SE SW 19-13n-2w, at 6440 ft. H. L. Hunt's Goodpine F-24, C SW SE 13-12n-5w, which was drilled to 9720 ft and plugged back to 9000 ft, is making production test.

Grant Parish: On the south end of the Tullos-Urania field, Placid Oil Co.'s Tremont B-1, C NE SW 10-9n-1e, had 15 ft of oil sand at top of Wilcox, about three times the average pay section, but depth was not disclosed.

NORTH LOUISIANA FIELD COMPLETIONS

Claiborne Parish—North Lisbon: Big West Drilling Co.'s Mitcham 1, 2640 ft s, 1310 e nw cor 12-21n-4w, elev 238 ft, Pettit lime 5051 ft, Travis Peak 5197 ft, abnd, 5304 ft.

Claiborne Parish—Haynesville: Robert A. Stacy's Hunt-Garrett 1, c ne ne 8-23n-8w, flow 525 bbls in 8 hrs, ¼-in, tp 600, packer in casing, perf Pettit lime 5429-39 ft, acidized 3000 gals, td 5516 ft.

Magnolia's Lowe 1, c sw ne 9-23n-8w, flow 38 bbls in 4 hrs, ¼-in, tp 225, cp 1210, gr 41.4, gor 313/1, perf Pettit lime 5372-85 ft, acidized 5000 gals, td 5426 ft.

Mid-States Oil Co.'s Gore 1, c ne nw 27-23n-8w, elev 333 ft, flow 450 bbls, 17 hrs, 24/64-in, tp 850, cp 800, perf Pettit lime 5412-28 ft, 5433-39 ft, and 5485-90 ft, td 5514 ft.

Robert A. Stacy's Knox 1, c ne ne 20-23n-8w, flow 35 bbls 1 hr, ¼-in, tp 500, packer in casing, perf Pettit lime 5381-85 ft, 5389-95 ft, 5414-18 ft and 5438-45 ft, acidized 4000 gals, td 5490 ft.

Claiborne Parish — Sugar Creek: Carter's Dobbins 3, c sw sw 1-19n-6w, flow 52 bbls, 12/64-in, tp 525, cp 700, gor 430, perf Pettit lime 4618-23 ft, td 6028 ft.

Caddo Parish—Caddo-Pine Island: Magnolia's Doan-Thigpen 41, c ne ne ne 6-20n-15w, flow 70 bbls, 1540 ft.

Bering Oil Co.'s Hurdle 1, 34-22n-16w, flow 140 bbls, ¼-in, td 2416 ft.

De Soto Parish—Logansport: Arkansas Louisiana Gas Co.'s A. W. Wells Unit 1, 31-12n-15w, 120,000,000 gas, perf 4868-4940 ft, td 5024 ft.

LaSalle Parish — Nebo - Hemphill: H. L. Hunt's Goodpine F-120, 8-7n-3e, flow 211 bbls, 4089 ft.

NORTH LOUISIANA WILDCAT COMPLETIONS

LaSalle Parish: Aubrey M. Poynter's Heard 1, c sw se 13-8n-3e, Wilcox 2553 ft, abnd, 3634 ft.

Concordia Parish: Texas Co.'s Madison 1, 1600 ft n, 2100 e, sw cor 30-5n-8e, Wilcox 4645 ft, abnd 6705 ft.

Bossier Parish: J. C. Robbins and H. G. Lewis' Ellerbe 1, c nw ne 3-20n-13w, abnd 2270 ft.

Madison Parish: Continental's Patterson 1, 5000 ft ne along se line from s cor 7-16n-12e, abnd 3043 ft.

NORTH LOUISIANA WILDCAT STARTS

Grant Parish: Placid Oil Co.'s Tremont B-2, c sw nw 10-9n-1e, lcn.

Tensas Parish: Las Tecas Petroleum Co.'s Weatherly A-1, c ne ne 38-12n-12e, lcn.

LaSalle Parish: Alexander Brothers' Haynes-Urania 1, c nw se 2-9n-1e, lcn.

Claiborne Parish: Gulf's Miller 1, c ne ne 14-20n-8w, dr.

Catahoula Parish: Continental's Jones 1, c se se se 35-10n-8e, dr.

ARKANSAS FIELD COMPLETIONS

Columbia County — Dorcheat: Magnolia's Nipper 1, c ne se 14-18s-22w, elev 281, flow 117 bbls, ¼-in, tp 235, gor 4142/1, 46.9-gr, perf Cotton Valley 7020-34 ft, td 8916 ft.

Robert A. Stacy's Barton 1, c sw se 11-18s-22w, flow 240 bbls, ¼-in, 44-gr, 8960 ft.

Columbia County — Macedonia: Magnolia's Willis West Unit 1, c n½ se¼ 17-18s-21w, dual completion; perf Cotton Valley 8294-96 ft, flow 154 bbls, ¼-in, cp 2000; perf Smackover 8902-12 ft, flow 187 bbls, ¼-in, 62-gr, tp 2710, gor 14,888/1, td 8930 ft.

Magnolia's Willis Unit B-1, c s½ sw¼ 17-18s-21w, dual completion, flow 132 bbls distillate, ¼-in, cp 3200, and 2,937,000 gas from Cotton Valley, gor 18,162/1; flow 217 bbls, ¼-in, tp 2400, and 3,355,000 from Smackover, gor 15,463/1, gr 62, td 8961 ft.

Columbia County—Stephens-Smart: R. H. Crow's J. W. Smart E-1, c sw se 12-15s-20w, pump 280 bbls, perf Smart sand 3390-96 ft and 3400-09 ft, td 4000 ft.

ARKANSAS WILDCAT COMPLETIONS

Lafayette County: Mid-Continent's Russell 1, c ne ne 15-15s-25w, Smackover lime 6904 ft, abnd, 7276 ft.

Union County: Crescent Drilling Co.'s Root 1, c ne ne 25-18s-15w, Smackover lime 7354 ft, abnd 7465 ft.

Ouachita County: North Central Texas Oil Co.'s Fort Smith Timber and Land Co. 1, c nw nw 15-12s-17w, abnd 3505 ft.

ARKANSAS WILDCAT STARTS

Columbia County: Roy Lee, Trustee's L. Pickler 1, c sw ne 23-17s-21w, lcn.

Calhoun County: Skelly's Calion Lumber Co. 1, c ne se 27-15s-14w, spud.

H. L. Hunt's Furlow-Abbott 1, c sw se 28-14s-14w, rig.

Nevada County: Berry Asphalt Co.'s Berry Asphalt Co. 1, c sw se ne 5-14s-20w, lcn.

Union County: C. H. Lyons' Union Sawmill Co. 1, c sw nw 13-18s-12w, lcn.

Gulf's Murphy & Hardy 40, 750 n, 450 e, sw cor 3-16s-15w, workover, to perf Nacatoch 1960-1990 ft, old td 2383, plug back to 2025 ft.

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Clarke County Wildcat Setting Pipe to Test

Clarke County wildcat has oil show and will set pipe for production test. Deep wildcat to be drilled in Lincoln County. Third well begins and fourth staked for Cary field of Sharkey County.

Clarke County: In an area where a junked wildcat had already proven the

existence of oil, A. B. Irion Drilling Co.'s Long Bell 1, SW SE SW 10-2n-16e, found a showing of oil in 9 feet of the Eutaw sand, in a core from 3679 to 3698 ft, topping the water level at the latter depth. Casing will be run for production test. The show came in at the same level as that in Macro Drilling Co.'s Long-Bell 1, in the same section, where a drill-stem test showed 5 ft of clean oil. Casing was run in Macro's test, but it parted before being cemented and the well was junked and rig skidded over. Irion's wildcat also was delayed by fishing job but completed it successfully.

Lincoln County: California Co. and Sun Oil Co. have worked out an agreement to drill a 7500-ft wildcat in N½ N½ 4-7n-7e. The California Co. holds a block in townships 7 and 8N-R7E.

Sharkey County: In the Cary field, the discoverer of this area, British-American Oil Producing Co. has set surface casing at the third well for the spot, Lee Pickert 1, C SW NE NE 22-11n-7w, and has staked the fourth one, F. B. Houston 3, C SW SE SE, 15-11n-7w.

MISSISSIPPI WILDCAT COMPLETIONS

Lamar County: Placid Oil Co.'s Batson 3, c sw nw 30-1n-16w, information withheld, abnd 5997 ft.

Lincoln County: Freeport Sulphur Co.'s Lee 1, 1127 ft s, 145 ft w, ne cor 21-5n-9e, elev 521 ft, cap rock 2222 ft, bottom cap rock 2261 ft, anhydrite 2715, stain of heavy oil in cap rock, perf 2180 to 2238 ft, made DST, open 8 hrs, recovered 1450 ft sulphur water; DST 2247-63, ¼-in, ⅜-in, recovered 480 ft salt water, abnd, 2734 ft.

MISSISSIPPI WILDCAT STARTS

Lincoln County: Freeport Sulphur Co.'s Clark 1, 2360 ft e and 1100 ft s nw cor 22-5n-9e, moving in rig.

Adams County: Pure Oil Co.'s McDowell 1, 790 ft n, 765 ft w, se cor 1-6n-4w, spud.

Madison County: Love Petroleum Co.'s Anderson 1, c ne nw 12-8n-1w, lcn.

Hinds County: Plains Production Co.'s Gaddis 1, c nw ne 7-7n-3w, set surface casing.

Lamar County: W. S. F. Tatum's Fee 4, nw c 13-2n-16w, rig.

ALABAMA WILDCAT START

Walker County: Superior Oil Co.'s Moss & McCormack 1, sw se ne 14-14s-9w, moving in rig.

California

Large Well Finaled In Old Midway-Sunset

Large producer completed in old Midway-Sunset area, Kern County. New deep producing zone indicated for Del Valle pool in Los Angeles County. Wildcat play being readied for Goleta area, Santa Barbara County.

Kern County: Standard Oil Co. has completed 15-19B, 19-32-24, Maricopa Flats section of the Midway-Sunset field, flowing at an initial rate of between 1000 and 1500 bbls daily (based on 6-hr flow test) from a sand believed to be the Lakeview. Zone was topped at 2558 ft and production test was made on interval from top of zone to bottom at 2650 ft. Location of the producer is approximately 3 miles northwest of the famous Lakeview Gusher, completed by Union in 1910, and may open an extensive area to redrilling. Following the disastrous blowout of the Lakeview Gusher, which ran wild for some nine months in 1910 and flowed for a considerable period at the rate of 50,000 bbls daily, no large wells were completed in the Lakeview sands. It was believed that the blowout of the Union well had drawn off all flush possibilities in the zone.

Los Angeles County: R. E. Havenstrite has proven the production possibilities of a new deep sand in the Del Valle field in drilling Barnes 2, 16-4-17, which, on formation test of interval 7866 ft to bottom at 7975 ft, flowed at an estimated rate of 1500 bbls daily, 42-gr clean oil, together with an estimated 8000 mcf of gas. Well is being cored ahead below 8100 ft in sand and shale, with recovery almost negligible.

Santa Barbara County: Security Land & Royalty Co. has staked location for a wildcat in the Goleta area, to be known as County 1, 12-4-28. Operator has leased 1000 acres in area and will examine production possibilities in the Vaqueros.

CALIFORNIA FIELD COMPLETIONS

Fresno County—Coalinga Old Field: Standard's 105-35A, 2310 ft n 330 ft e s¼c 35-19-15, flow 2,000,000 gas, 145 ft perf 3079 ft, td 3170 ft.

Fresno County—Riverdale: Amerada's Brum 58-15, 330 ft n 330 ft e s¼c 15-17-19, flow 410 bbls 35.9 gr, 18/64-in, perf 6760-6766, 6770-6780, 6630-6638 ft, td 6840 ft.

Kern County—Belridge: Belridge's 68-33, 591 ft n 1924 ft w sec 33-28-21, pump 50 bbls 13-gr, 338 ft perf 760 ft, td 760 ft.

Belridge's 78-33, 591 ft n 1260 ft w sec 33-28-21, pump 95 bbls 13-gr, 347 ft perf 750 ft, td 750 ft.

Belridge's 78A-33, 260 ft n 978 ft w sec 33-28-21, pump 85 bbls 13.4-gr, 344 ft perf 762 ft, td 762 ft.

Belridge's 48A-34, 233 ft n 2153 ft e swc 34-28-21, pump, no est, 399 ft perf 800 ft, td 800 ft.

General Petroleum's Marina 3-76-A, 383 ft w s¼ c 3-29-21, pump 24 bbls 13.1-gr, perf 1055-1030 ft, td 1168 ft.

Ohio's Hopkins Fee 3, 233 ft s 715 ft w nec 4-29-21, pump 52 bbls, 258 ft perf 836 ft, td 849 ft.

Kern County—Buena Vista Hills: Standard's 15-19D, 327 ft n 327 ft w s¼c 19-32-24, flow 450 bbls, 32 ft perf 2643 ft, td 2650 ft.

Kern County — Midway-Sunset: Richfield's Belgian 1-A, 1242 ft s 340 ft w nec 3-31-22,

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pump 73 bbls 15.5-gr 165 ft perf 1098 ft, td 1098 ft.

Standard's 68-31E, 817 ft s 2228 ft w nec 31-12-23, pump 61 bbls 27.8-gr 25 ft perf 2221 ft, Kinsey zone 2203 ft, td 2223 ft.

Los Angeles County—East Coyote: Hathaway Co.'s Anaheim-Union 6, 310 ft s 342 ft e nwc Anaheim-Union lease, 18-3-9, pump 67 bbls, perfs at intervals 4060-4485 ft, td 5480 ft.

Los Angeles County — Newhall - Potrero: Barnsdall's RSF 30, 4369 ft s 4491 ft e c "J," 27-4-17, flow 1368 bbls 331 ft perf 7175 ft, top 1st zone 6245 ft, 3rd zone 6970 ft, td 7177 ft.

Los Angeles County—Wilmington: D. D. Dunlap and Jonah Jones' LB-2, 85 ft nely along s line Water St from int s line Water st & n line Cerritos Slough, thence 25 ft sely at r/a, pump 75 bbls 298 ft, perf 3124 ft, td 3130 ft.

Long Beach Oil Development Co.'s W-34, 110 ft nely along n line of Seaside from e side of 23rd ave, thence 300 ft sely at r/a, pump 237 bbls 840 perf 3800 ft, td 3805 ft.

CALIFORNIA WILDCAT COMPLETION

Fresno County—Failure: Dyer Creek-Jasmine Area: Fred Jasper Jr.'s Jasper 1, 660 ft n 990 ft e w¼ c 16-26-27, greenish sand and clay 4163 ft, Vedder showing oil spots 3360 ft, abnd granite 4421 ft.

Michigan

Arenac County Wildcat Showing in Richfield

Arenac County wildcat showing in Richfield lime horizon at 4167 feet as plugback work continues on Missaukee County discovery well.

Arenac County—Wildcat: W. L. McClanahan and Cline Bagwell's Milligan 1, C SE SE 3-19n-6e, Augres Township, carried 600 ft oil in 10 hrs from Richfield lime at 4163-67 ft. Water sand at 4167½ ft logged and drilling suspended. Operators undecided whether to deepen or plugback and acidize.

Basin and Rayburn's Demurra 1, C SE NW 25-19n-3e, ½ mile northwest of deep wells, logged 800 ft of oil in Richfield lime at 4287 ft to indicate important extension of field.

Missaukee County—Aetna: Plugged back 3 ft Gordon Oil Co.'s Blue 1, 26-22n-6w, discovery well, continued to show water with an average swab production of 34 bbls. per day. It will be plugged back to 3840 ft and acidized.

Newaygo County—Wildcat: Pure Oil Co. suspended Kasen 1, S½ SW SW 22-16n-11w, Barton Township, at 4214 ft; logged water in Monroe lime but may be carried to Richfield.

Osceola County—Reed City: Ohio Oil Co.'s Kent 1, SE SW 18-18n-10w, north end Reed City pool, completed for 125 bbls in Traverse lime at 2972 ft and will encourage additional Traverse lime drilling in field.

MICHIGAN FIELD COMPLETIONS

Allegan County—Dorr: James McGerry's Nagarski 1, sw sw se 36-4n-12w, abnd 1188 ft.

Allegan County—Trowbridge: A. W. Winchester's Russell 2, e½ nw se 30-1n-13w, Traverse lime, pump 40 bbls, 1346 ft.

Bay County—Kawkawlin: Gulf's Friebe 1, n½ nw nw 35-15n-4e, Dundee lime, flow 86 bbls, 2932 ft.

Isabella County—Deerfield: L. & S. Drilling Co.'s Hein 1, ne se se 13-14n-6w, Stray sand, 300,000 gas, 1345 ft.

Lake County—Sauble: Gordon Oil Co.'s Myers 2, ne se sw 16-19n-14w, Traverse lime, flow 41 bbls, 2152 ft.

Freeman Oil Co.'s Bortz 1, ne nw nw 27-19n-14w, abnd 1375 ft.

Missaukee County—Norwich: Sun's Camlin 1, s½ se se 10-24n-5w, Richfield lime, flow 32 bbls, 4457 ft.

Missaukee County—Riverside: Taggart Bros. Co.'s DeSwan 59, c se 21-21n-7w, Stray sand, abnd 1429 ft.

Osceola County—Reed City: Ohio's Kent 1, s½ se sw 18-18n-10w, Traverse lime, flow 132 bbls, 2972 ft.

E. Bennight's Howe 1, s½ nw ne 20-18n-10w, Monroe lime, flow 350 bbls 10 hrs, 3460 ft.

Gulf's Bregg 2, n½ sw sw 5-17n-10w, Monroe lime, abnd 3577 ft.

Van Buren County—Bangor: T. C. Hudson's Starz 5, se sw sw 21-2s-16w, Traverse lime, pump 75 bbls, 999 ft.

MICHIGAN WILDCAT COMPLETIONS

Newaygo County—Failure: C. W. Teater's Jewell 1, w½ ne se 24-16n-14w, Traverse lime 2260 ft, abnd 2795 ft.

Oakland County — Failure: Fisher-Mcall's Tireman 1, c se 32-13n-15w, abnd 1290 ft.

Oceana County — Failure: Muskegon Dev. Co.'s Biegalle 1, c sw nw 32-13n-15w, abnd 2048 ft.

Osceola County—Failure: Gordon Oil Co.'s State J1, nw ne 17-20n-7w, Dundee 3913 ft, water 4054 ft, abnd 4067 ft.

Ottawa County — Failure: Lester Harris' Vande Bunde 1, n ne nw 21-5n-13w, Traverse 1693 ft, abnd 1718 ft.

MICHIGAN WILDCAT STARTS

Allegan County: Muskegon Oil Co.'s Bala 1, w½ nw se 33-4n-12w, lcn.

J. W. Lang's Johnson 1, sw ne sw 2-2n-14w, rig.

Lenawee County: J. L. England's Dunigan 1, ne nw ne 7-7s-1e, lcn.

Mecosta County: Gordon Oil Co.'s Helmer 1, n ne ne 17-15n-8w, rig.

Eastern States

OHIO COMPLETIONS

Ashland County: Ohio Fuel's Ryland 2, 0.02 gas, 2972 ft.

Lyons Co.'s Krebs 1, 0.32 gas, 2862 ft.

Athens County: H. B. Walker's Winget 1, 0.34 gas, 1096 ft.

Cuyahoga County: Benedum-Trees' Parker 1, 1.48 gas, 1896 ft.

Holmes County: Ohio Fuel's Leckrone 1, 0.22 gas, 3309 ft.

Knox County: Ohio Fuel's Lower 2, abnd, 2889 ft.

Lawrence County: Pawnee Corp.'s Holliday 1, 0.1 gas, 2952 ft.

Licking County: Mary Ann Oil & Gas Co.'s Shannon 8, 1 bbl, 693 ft.

Medina County: Ohio Fuel's Lyons 1, 1.25 gas, 3530 ft.

Meigs County: Proffit et al's Taggart 2, 0.02 gas, 3446 ft.

Ohio Fuel's Helwig 1, 0.19 gas, 1654 ft.

Monroe County: Monroe Oil Co.'s Kemp 1, abnd, 1500 ft.

Morgan County: Ohio Fuel's Eppley 1, 3.5 gas, 4231 ft.

Muskingum County: Ohio Fuel Gas Co.'s Moore 1, 0.07 gas, 4147 ft.

Noble County: S. E. Ruby's Williams 1, 0.05 gas, 1740 ft.

Perry County: J. L. Swingle et al's Hazlett 1, 0.15 gas, 1215 ft.

Industrial Gas Corp.'s Long 3, 220 bbls, 2735 ft.

Preston Oil's Jacot Kelfer 2, abnd, 3409 ft.

Summit County: Wm. Dempsey's Robinson 1, abnd, 3128 ft.

Washington County: Russell Hanlon et al's Hood 1, 2 bbls & 0.25 gas, 2205 ft.

Chas. Wirth's Morgenstern 6, 0.01 gas, 688 ft.

OLD WELL DRILLED DEEPER

Washington County: H. Jones et al's Patterson 14, 0.06 gas, deepened from 1388 to 1541 ft.

PENNSYLVANIA COMPLETIONS

Armstrong County: Carnegie Natural Gas Co.'s Orr 2, 0.27 gas, 3028 ft.

Clarion County: United Natural Gas Co.'s McKee 1, 0.14 gas, 2703 ft.

Greene County: Chas. Orndoff et al's King heirs 1, 0.82 gas, 3330 ft.

Peoples Nat. Gas Co.'s Rinehart 7, 0.06 gas, 3535 ft.

OLD WELL DRILLED DEEPER

Washington County: South Penn Oil Co.'s Piedmont Coal Co. 1, 2 bbls, 2945 ft.

WEST VIRGINIA COMPLETIONS

Boone County: Owens-Libby-Owens, Cassingham Coal Land Co. 639, 0.12 gas, 2204 ft.

Calhoun County: Clem S. Morris' Van Camp 1, 0.42 gas, 1658 ft.

Bowser Gas Co.'s McDonald 3, 4 bbls, 2182 ft.

Clay County: Virginian Gasoline & Oil Corp.'s Brown, Goshorn & Swan 1324, 3 bbls, 1786 ft.

Gilmer County: F. G. Bish's Messenger 5, 0.11 gas, 1715 ft.

Jackson County: Godfrey L. Cabot, Inc.'s Speens 1, abnd, 5437 ft.

West Virginia Gas Corp.'s Cunningham 1, 3.09 gas, 5199 ft.

Kanawha County: Columbian Carbon Co.'s Jones 10, 50 bbls, 1563 ft.

Monongalia County: Philadelphia Oil Co.'s Tennant 1, 1 bbl, 3220 ft.

Putnam County: Summit Gas Co.'s Burdette 5, 0.08 gas, 2234 ft.

Ritchie County: West Va. Investment Corp.'s Parks et al 27, abnd, 1954 ft.

Upshur County: Cumberland & Allegheny Gas Co.'s Riffle 327, 0.39 gas, 1843 ft.

OLD WELL DEEPENED

Lincoln County: United Fuel Gas Co.'s Lincoln Co. Land Assn. 2264, 0.03 gas, deepened from 2343 to 3528 ft.

Men in the Industry's News

THOMAS R. ARMSTRONG, associate head of the producing department of Standard Oil Company of New Jersey, has been appointed chief of the foreign requirements liaison branch of the War Production Board, just created in the program conservation division, itself a new organization established to recommend an integrated over-all national production of the WPB vice chairman on program determination.

In his new post, Armstrong will maintain liaison with the Board of Economic Warfare, Lend-Lease Administration and all other agencies concerned with foreign purchases or requirements, and will review all purchases by or on behalf of all foreign governments, following and expediting the preparation and presentation of their requirements estimates to meet the specifications and time schedule of the program coordination division.

Armstrong was born 50 years ago in Corpus Christi, Texas, the son of a captain in the Texas Rangers. He joined Standard in 1919, after service in the last war as a major of field artillery, taking charge of an exploration expedition in Colombia and Venezuela, later establishing operating subsidiaries for the company in Venezuela, Bolivia and Argentina. As associate head of production, he has been an officer of overseas subsidiaries, including Lago Petroleum Corporations, European Gas & Electric Company and Pan American Foreign Company.

A. W. THOMAS, sales manager of the construction machinery division of Chain Belt Company, is in Washington as consultant for the construction machinery division of the War Production Board.

Mr. Thomas is a graduate of Purdue University in civil engineering and has been with Chain Belt Company for fifteen years, serving on both the engineering and sales staffs. During his absence, his duties will be taken over by D. A. Kalton, assistant sales manager of the construction machinery division.

MORTIMER KLINE, Los Angeles oil attorney, has been appointed associate chief counsel in the OPC, Deputy Coordinator Davies announced, October 1.

For the past 15 years Kline has engaged in general legal practice, and is known in oil circles through his participation in a series of cases brought to eliminate "crooked-hole" drilling.

DR. ROY R. MORSE, manager of exploration of Shell Oil Company, spoke on "Geological Highlights of Unoccupied China" before the Houston Geological Society October 8. He discussed the topographic and regional geological features and pointed out their intimate relations to the war.

F. C. PLATT of Shelby, Montana, has been appointed Montana Oil and Gas Field Inspector. He succeeds T. H. Herriman, who has resigned.

R. D. NOBLE, chief accountant for Shell Oil Company of British Columbia, has been appointed to a position with the Wartime Prices and Trade Board in Ottawa. Noble, who was educated and has lived in Vancouver for 30 years, joined Shell in Vancouver seven years ago as chief accountant, where he has remained until now.

T. R. RUSSELL has returned to Michigan from Illinois where he has been connected with production and pipe line activity for the past three years, to become assistant general superintendent for Oil Field Management, Inc., St. Louis, Michigan.

BLISS M. KEELER of Lansing, independent, has been commissioned Captain in the intelligence division of the Air Corps. He is a director of the Oil and Gas Association of Michigan.

HOLLIS P. PORTER, veteran member of the Mid-Continent section of ASME, was honored by fellow members of the association and by Engineers Club of Tulsa at their October 5 meeting.

A. K. DENISON and W. R. Born were speakers at the first fall meeting of Tulsa Geological Society held October 5 at the University of Tulsa.

G. L. THOMPSON, independent operator of Oklahoma, is now a First Lieutenant in the Army.

A. S. RITCHIE, president of McPherson Drilling Company, Wichita, was principal speaker before the Engineers Club of Tulsa, October 5. He discussed OPC activity, limitation of materials as a result of war, and producible volumes in District 2 of which area he represents Kansas on the production committee.

C. R. GEDDES is now the Tulsa representative for Bridgeport Machine Company.

W. I. STRALEY is assistant purchasing agent for Bovaird Supply Company, Tulsa, succeeding Paul Sowers who is in the Army.

J. C. SHOUVLIN, formerly connected with The Bauer Brothers Company in Springfield, Ohio, has been commissioned lieutenant colonel in Ordnance Department. Colonel Shouvlin, prior to his association with the Bauer Brothers Company, was long connected with The National Supply Co. as vice president of the Superior Engine Division.

D. J. CROSBY of Humble Oil & Refining Company has been elected president of Texas Gulf Coast Oil Scouts Association. Other new officers are E. M. Pinckard of The Pure Oil Company, vice president; M. S. Baker, Standard Oil Company of Texas, secretary-treasurer; and Paul Edman, Tide Water Associated Oil Company, editor of 1942 Yearbook.

PERRY R. CASSIDY, former executive assistant, The Babcock & Wilcox Company is now Lieutenant Colonel in the Army Engineer Corps. He was a captain in the coast artillery in World War I, his last assignment being at the school for antiaircraft officers at Fort Monroe. He began his service with Babcock & Wilcox in 1916 and was appointed a vice president of Fuller Lehigh Company in 1928. Upon the consolidation of Fuller Lehigh with Babcock & Wilcox he was made an executive assistant of the latter company, holding that position until entering the service. He is a member of the Boiler Code Committee of the Amer-

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and
FEED WATER HEATERS

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ican Society of Mechanical Engineers, the American Welding Society, American Society for Testing Materials, American Society for Metals and the author of a number of technical papers. He was also a member of the technical advisory committee on alloy steel plate of WPB.

CYRIL K. MORESI, former state geologist for Louisiana and consulting geologist, has been elected president of New Orleans Geological Society. J. V. Hoover of The California Company was named vice president while W. J. Gillingham, division manager of Schlumberger Well Surveying Corporation, was elected secretary-treasurer.

ALLEN A. JERGINS, vice president of the Jergins Oil Company, Long Beach, California, has been appointed director at large for the OPC Facility Security Division. His job will be to serve as a field assistant to William D. Mason, director of the division, in coordinating and directing measures for the security of the country's oil facilities.

The OPC also announced appointment of four district directors for the division: Frank A. Epps, president of the Sparton Oil Company, Dover, New Jersey, for district 1; Edward J. Bullock, vice president until recently of Standard Oil Company (Indiana), Chicago, for district 2; George Sawtelle, president of the Kirby Petroleum Company, Houston, for district 3, and George F. Prushing, until 18 months ago in charge of safety and fire prevention for the Union Oil Company and since executive secretary for the Western Region PIWC Committee on Protection of Petroleum Facilities, Los Angeles, for district 5.

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OIL CITY BRASS WORKS
FOUNDERS · MANUFACTURERS · MACHINISTS
Beaumont, Texas, U.S.A.

Squeaks from the Bull Wheel

Still an Emergency

"I'd like to buy a brassiere."

"What bust?"

"Oh, nothing, my old one just wore out!"

Getting Higher

Sales Manager: "You give me a pain in the neck."

Salesman: "Thanks for the promotion."

No Mind Reader

"Is my face dirty, or is it my imagination?"

"I don't know about your imagination, but your face is clean."

Better Get Up

"If I take this castor oil do you think I'll be well enough to get up in the morning?"

"Well—you'd better!"

Rights

A young Cockney lad and a general were discussing the present situation. Said the boy: "My father says one bloomin' politician is a bigger bloody fool than another." "If that's how he felt," asked the general, "why did he volunteer before his time came to be conscripted?" "Oh," was the reply, "'e told me all abaht that before he went awiy. 'Son, 'e said, 'we ain't fightin' this war for them swarmy 'ypocrites of politicians. We're fightin' it to keep the most important right an Englishman 'as —the right to be against the government.'"

Resourceful

Little Mary was left to fix the lunch, and when her mother returned with a friend, she observed that Mary had the tea strained.

"Did you find the lost strainer, dear?" mother inquired, as they were eating.

"No, mother," replied helpful Mary. "I used the fly swatter."

Going Up!

A lawyer whose office was on the twelfth floor was expecting a client of his from the country. The door opened and the client entered, puffing violently.

"Some walk up those 12 flights," he panted.

"But why didn't you take the elevator?" asked the attorney.

"I meant to," replied the client, "but I missed it!"

Signs

A wedding carriage was seen driving through the streets of London the other morning. Inscribed in chalk on the back were the words, "Result of Careless Talk."

"Two Whistle" Ring

A young chap, whose sweetie had just made him the happiest man alive, went into a jewelry store to buy the engagement ring. He picked up a sparkling diamond and asked its price.

"That one is $100," replied the jeweler gently.

The young man looked startled, then whistled. He pointed to another ring. "And this one?"

"That, sir," said the jeweler still more gently, "is two whistles."

Rebuttal

"I don't say that all lawyers are crooks," said the doctor, "but you'll have to admit that your profession doesn't make angels of men."

"No you doctors certainly have the best of us there."

Ah, for the Good Old Days

The American newly-arrived in London sat down at his hotel table and briskly began to give his order. "I'd like a thick porterhouse steak smothered in mushrooms, some buttered toast—"

"Excuse me, sir," interrupted the waiter gently, "are you trying to give an order, or just reminiscing about old times?"

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"OIL WELL EQUIPMENT" SINCE 1906
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SEE McEVOY'S 20 PAGE SECTION IN YOUR COMPOSITE CATALOG

CHRISTMAS TREES
"COUNTER-HYDROSTATIC" GAS LIFTS
"COUNTER-HYDROSTATIC" INTERMITTERS

Notes for the Equipment Buyer and User

Pipe Cutter

ALSTON MACHINE SHOP

J. I. HILL COMPANY

J. I. Hill Company, 1011 Shell Building, Houston, exclusive sales representative, announces a new ratchet type pipe cutter and beveling tool being manufactured by Alston Machine Shop, Livingston, Texas.

This new type pipe cutter and beveling tool is being offered in straight sizes for specific size of pipe from 6- to 26-inch and in combinations to handle two sizes of pipe from 6- to 4-inch and 26- to 24-inch.

The manufacturer states that this new ratchet type pipe cutter has many outstanding features, among which are the patented roller guide members which hug the pipe and prevent any of the three cutters from executing more than the predetermined cut. This feature also forces the cutters to penetrate thick places in the pipe. Three rollers, equally spaced around the circumference of the pipe, hold the pipe taut after being cut and eliminate the hazard of broken cutters or dangerous sparks. A square cut is assured, the manufacturer states, by attaching bands to either side of the cutter. The bevel tool, which can be set by an individual adjustment screw to any required depth, follows in the path of the cutter, removes burrs from edge of pipe and automatically conditions it for welding, threading or sleeving. This bevel tool may be used singularly for cutting cast iron pipe. Simply raise the three cutters with the set screws provided and allow the bevel tool (same type as on lathe) to contact the pipe.

The ratchet principle enables operators to work in close quarters and eliminates the need to dig bell holes to cut buried pipe.

Alston Pipe Cutter

Arc Control

WILSON WELDER AND METALS COMPANY

Wilson Welder and Metals Company, New York, has announced development of Honey Bee arc-control station, designed to give greater welding output per machine and better control by the operator and improved welds on thin gauge metal.

These arc-control stations are made in capacities of 75 amperes and 150 amperes. They are an auxiliary electric device, connected in series with the welding circuit of any constant potential arc-welding generator. Most conventional drooping voltage generators can be converted quickly to constant potential. For this purpose, Wilson supplies a quick change switch mounted on the generator. A portable switch held in the operator's hand gives the operator remote control of the welding current within predetermined limits. This switch may be combined with the electrode holder, if desired.

When two or more arc-control stations are hooked up to a single generator, a like number of welding arcs can be operated simultaneously. Each operator can regulate his own current and weld as he sees fit without affecting the other in any way. One of the important features of this new arrangement is the remote control of the arc when the operator reaches the end of a bead, thereby enabling him to greatly improve the quality of the weld deposit at the crater. This is accomplished by gradually reducing the current which, in turn, reduces the heat and avoids porous, cracked craters and inclusions.

Three Wilson Honey Bee arc-control stations attached to a Wilson "Hornet" welder.

V-Belt Drives

Simplifying the problem of selecting correct V-belt drives for wartime applications is the primary purpose of a new texrope V-belt drive bulletin, issued by Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.

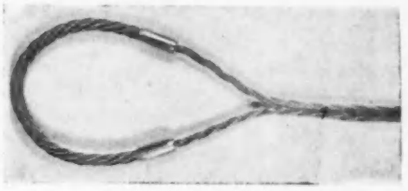
Based on the theory that efficient V-belt power transmission applications necessarily begin with the choice of proper equipment, the book reduces a wealth of engineering information to simplified charts and tables for quick selection of these power transmission units. From known factor and special service factor tables, correct V-belt and sheave sizes can be determined, the desired nominal horsepower ratings, and finally the texrope drive catalog number are arrived at. This catalog number is then the key to the number of belts, belt section, belt length, the motor sheave and driven shaft sheave diameters.

Wire Rope Slings

JOHN A. ROEBLING'S SONS COMPANY

John A. Roebling's Sons Company, Trenton, New Jersey, has announced development of a new wire rope sling to meet a universal need for a light, flexible, non-kinking, non-spiralling sling to handle loads more easily. It was developed specifically for lifting light and medium loads where the legs choke the load or the sling comes in direct contact with the load being lifted.

"Flatweave" slings have a flat bearing surface which allows an even pressure on each of the six ropes which comprise the sling, thereby prolonging its useful life. Being flat and flexible, they are easily passed through or under the load.



Roebling Sling.

The "flatweave" body is made up of six separate ropes. Two pairs of two ropes each are laid in opposite directions. These are united into a finished sling unit by two single tie ropes which alternately pass back and forth around one pair and then the other in a spiral figure 8. This method of construction eliminates the possibility of any scissors or shearing action between the various ropes.

The "flatweave" pattern develops a high strength efficiency which is equaled by the high efficiency of the specially constructed loops. The same safe loads can therefore be allowed with loops as with socketed ends. The loops, which can be used as chokers without the use of thimbles, are generously proportioned and easily slip over crane hooks or lifting lugs.

The compact steel sleeves are compressed over all rope ends, thus permanently securing them. There are no splices, tucks or servings to become dislodged or loosened over sharp corners or in pulling underneath loads.

Centrifugal Pumps

Allis-Chalmers Manufacturing Company, Milwaukee, has released a compact compilation of facts on their centrifugal pump line, known as bulletin B6059-H.

The variety of emergency wartime applications has been kept in mind in preparing the concise descriptions, charts and diagrams in the new book. Construction features, sizes and capacities are listed in a manner which simplifies the choice of proper pumping equipment for specific needs.

Included in the bulletin are pump types for every purpose—single and double suction, single and multi-stage, mixed and axial flow, combined Allis-

Chalmers units and special pumps to solve special problems. Recommended applications for the one-package pump unit, the Allis-Chalmers Electrifugal, are also included.

Flexible Couplings

Poole Foundry & Machine Company, Baltimore, Maryland, has issued a new booklet on "Flexible Couplings," listing their value and many advantages. The catalog, which is number 42, supersedes all previous issues and the information pertains to all flexible couplings of the company's manufacture, embodying data, tables and information that has not yet been presented in any catalogs of this nature.

The catalog is designed to be a reference to all users of flexible equipment and engineers specifying such equipment.

Cooper-Bessemer Sets New Production Mark

Despite the growing shortage of critical materials, Cooper-Bessemer Corporation, Mount Vernon, Ohio, is reported to have surpassed its increasing monthly production goal for the fourth consecutive month.

The management points out that there has been no interruption in their program of bettering and expanding production facilities. A large, newly completed foundry core shop was recently placed in operation.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of THE OIL WEEKLY, published weekly at Houston, Texas, for October 1, 1942.

State of Texas, County of Harris, ss:

Before me, a Notary Public in and for the State and County aforesaid, personally appeared A. L. Burns, who, having been duly sworn according to law, deposes and says that he is the Business Manager of THE OIL WEEKLY and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Ray L. Dudley, 3381 Chevy Chase, Houston, Texas; Editorial Director, Spencer W. Robinson, 5002 Scotland, Houston, Texas; Editor, Warren L. Baker, 1613 Woodhead, Houston, Texas; Managing Editor, J. Kent Ridley, 612 Branard, Houston, Texas; Business Manager, A. L. Burns, 1751 Marshall, Houston, Texas.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

The Gulf Publishing Company, Houston, Texas; James Anderson, Houston, Texas; A. L. Burns, Houston, Texas; J. F. Carter, Jr., Tulsa, Okla.; Ray L. Dudley, Independent Executor and Trustee for Estate of Dr. N. L. Dudley, Deceased, Houston, Texas; Ray L. Dudley, Houston, Texas; W. S. Farish, Houston, Texas; Wm. V. Gross, Pipe Creek, Texas; Howard R. Hughes, Houston, Texas; Mrs. Anita S. Lane, Houston, Texas; Chas. H. Lane, Houston, Texas; Tom W. Nelson, Houston, Texas; Wallace E. Pratt, New York, N. Y.; J. Kent Ridley, Houston, Texas; S. W. Robinson, Houston, Texas; Mrs. Maude G. Sterling, LaPorte, Texas; R. P. Swinsky, New York, N. Y.; O. R. Waller, Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

A. L. BURNS, Business Manager.

Sworn to and subscribed before me this 29th day of September, 1942.

J. KENT RIDLEY,
(Seal) Notary Public, Harris County, Texas.
(My commission expires June 30, 1943.)

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*Abercrombie Pump Co. 59
*Acme Fishing Tool Co. —
Air Reduction Sales Co. —
*Ajax Iron Works. —
The Louis Allis Co. —
Aluminum Company of America —
Aluminum Ore Co. —
American Association of Petroleum Geologists —
*American Cable Division, American Chain & Cable Co. —
*American Iron & Machine Works Co. —
*American Meter Co. —
*American Sand-Banum Co. 61
*American Steel & Wire Co. —
Axelson Manufacturing Co. —

*B & W, Inc. —
*Baash-Ross Tool Co. —
*Baker Oil Tools, Inc. —
*Baldwin-Duckworth Division, Chain Belt Co. —
*Baroid Sales Division, National Lead Co. —
Wm. M. Barret, Inc. —
*Bethlehem Steel Co. 31
*Bethlehem Supply Co. —
Biltmore Hotel 58
*Black, Sivalls & Bryson, Inc. —
Black Construction Co. —
*S. R. Bowen Co. —
*Bowen Co. of Texas, Inc. —
*Braden Steel Corp. —
*The Brewster Co. —
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*Cardwell Manufacturing Co. —
*Caterpillar Tractor Co. —
*Chain Belt Co. —
*Clark Bros. Co. —
*Climax Molybdenum Co. —
*Coffing Hoist Co. 56
Columbia Steel Co. —
*Columbian Steel Tank Co. —
The Continental Oil Co. —
The Continental Supply Co. 6
*Fred E. Cooper —
*The Cooper-Bessemer Corp. —
Core Laboratories, Inc. —
W. H. Curtin & Co., Inc. —

O. E. Dempsey Construction Co. —
*Dowell Incorporated —
*E. I. du Pont de Nemours & Co. —

The Eagle-Picher Lead Co. 55
Economy Electric Lantern Co. —
*Elastic Stop Nut Corp. —
Emsco Derrick & Equipment Co. —

Federal Electric Co. —
First National Bank in Houston —
*The Edwin H. Fitler Co. —
Fluid Packed Pump Co. —
Fort Worth Clearing House Association —
Fort Worth Laboratories 60
*Franks Manufacturing Co. —
*Frick-Reid Supply Corp. —

*Gardner-Denver Co. 4
*The Garlock Packing Co. —
*Gaso Pump & Burner Manufacturing Co. —
The Gates Rubber Co. —
*Gatke Corp. —
General American Transportation Corp. 2
*General Electric Co. —
*The Goodyear Tire & Rubber Co. 1
*H. P. Gott Manufacturing Co. —
I. H. Grancell Co. —
*Grizzly Manufacturing Co. —
*The Guiberson Corp. —
*Gulf Coast Machine & Supply Co. —
Gulf Engineering Co. 61
Gulf Oil Corp. —
Gulf States Utilities Co. —

*Halliburton Oil Well Cementing Co. —
W. G. Hanrahan —
*Haynes Stellite Co. —
*Hazard Wire Rope Division, American Chain & Cable Co. —
Hercules Powder Co. —
*Hewitt Rubber Corp. —
Houston Laboratories 60
*Hughes Tool Co. I Cover
Humble Oil & Refining Co. —
*Hunt Tool Co. 39

Independent Exploration Co. 35
*Ingersoll-Rand Co. —
The International Nickel Co. —

Jarecki Manufacturing Co. —
*The Jeffrey Manufacturing Co. 41
Jensen Bros. Manufacturing Co. —
*Johns-Manville Corp. 48
The S. M. Jones Co. —
*Jones & Laughlin Steel Corp. —
*Justrite Manufacturing Co. —

*Kerotest Manufacturing Co. —
*Keuffel & Esser Co. —
*Kinzbach Tool Co. —
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*Larkin Packer Co. —
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*Le Roi Co. —
*A. Leschen & Sons Rope Co. —
*Link-Belt Co. —
Lone Star Cement Corp. —
*Lucey Boiler & Manufacturing Co. —
*Lucey Export Corp. —
*Lucey Products Corp. —
*The Ludlow Valve Manufacturing Co. —

Macklin Co. 53
Macwhyte Co. —
Magnet Cove Barium Corp. —
Mark Twain Hotel —
Marmon-Herrington Co. II Cover
*Martin-Decker Corp. —
*McCullough Tool Co. —
*McEvoy Co. 62
*McKissick Products Corp. —
*Merco Nordstrom Valve Co. —
*Metric Metal Works —
*Mission Manufacturing Co. —
*Morse Chain Co. —
Murphy Diesel Co. —

National Bank of Tulsa —
National Geophysical Co. —
National Hotels —
*National Lead Co. —
The National Supply Co. 24-25
National Tube Co. —
New Bedford Cordage Co. 60
Nicholson File Co. —

*The O. C. S. Manufacturing Co. —
*Oil Center Tool Co. —
*Oil City Brass Works 62
Oil Industry Mailing List Co. —
Oil Well Supply Co. 3
*Otis Pressure Control, Inc. —

*The Parkersburg Rig & Reel Co. —
*Patterson-Ballagh Corp. 59
*Pelican Well Tool & Supply Co. 57
Petroleum Electric Power Association —
Petroleum Rectifying Company of California —
*Pittsburgh Equitable Meter Co. —
*Pittsburgh Steel Co. —
*Plymouth Cordage Co. —
Power Specialty Co. —

*Quaker Rubber Corp. 41

*Raybestos-Manhattan, Inc. 52
Reading-Pratt & Cady Division, American Chain & Cable Co. —
*Rector Well Equipment Co. —
*Reed Roller Bit Co. 23
Reforma Hotel —
Republic National Bank in Dallas —
Republic Steel Corp. III Cover
*The Ridge Tool Co. 27
*John A. Roebling's Sons Co. 29
*Rollway Bearing Co. —
Rouse Exploration Drilling Co. —

*SKF Industries, Inc. —
*Schlumberger Well Surveying Co. —
The Second National Bank in Houston —
Seismic Explorations, Inc. —
Seismograph Service Corp. —
Shell Development Co. —
A. O. Smith Corp. —
*Southern Mill & Manufacturing Co. —
*Spang & Co. —
Spang Chalfant, Inc. —
*Sperry-Sun Well Surveying Co. —
*Standco Brake Lining Co. —
Tank Seal Products Co. —
Texaco Development Corp. —
*Texas & Louisiana Tool Co. —
*Texasteel Manufacturing Co. —
*Texsteam Corp. —
The Thermoid Co. —
*Thompson Tool Co. —
*Thornhill-Craver Co. 61
Treasury Department —
*Tretolite Co. —

*Union Carbide and Carbon Corp. —
*Union Wire Rope Corp. —
*Unit Rig & Equipment Co. —
United States Steel Corp. 3
*Universal Atlas Cement Corp. —

Valley Steel Products Co. —
Visco Products Co. —

Warner & Swasey Co. —
Warren Automatic Tool Co. —
Waugh Laboratories —
*Waukesha Motor Co. —
*Westinghouse Electric & Mfg. Co. —
*The Wheland Co. 51
White-Plaza Hotels —
*The Whitney Chain & Manufacturing Co. 42
Whitney National Bank —
*Wickwire Spencer Steel Co. —
*J. H. Williams & Co. —
*Wilson Manufacturing Co. —
Wilson Supply Co. —
*Wisconsin Motor Corp. —
*Worthington Pump & Machinery Corp. —
Wyatt Metal & Boiler Works IV Cover

York Oilfield Supply Co. —
The Youngstown Sheet & Tube Co. 21